

**Final
Site-Specific Field Sampling Plan
Site-Specific Safety and Health Plan
Site-Specific Unexploded Ordnance Safety Plan Attachments**

**Site Investigation at
Range 30, Confidence Course (Firing Line), Parcel 88Q
Former Rifle/Machine Gun Range, Parcel 102Q
Former Grenade Range/Area, Parcel 106Q-X
Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08)
Grenade Court (OA-15)
Unnamed Small Arms Range**

**Fort McClellan
Calhoun County, Alabama**

**Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887**

January 2002

Revision 0

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Site-Specific Field Sampling Plan Attachment**

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Former Rifle/Machine Gun Range, Parcel 102Q
Former Grenade Range/Area, Parcel 106Q-X
Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08)
Grenade Court (OA-15)
Unnamed Small Arms Range**

**Fort McClellan
Calhoun County, Alabama**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

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Contract No. DACA21-96-D-0018
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Revision 0

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK10, IT Corporation (IT) will conduct site investigation (SI) activities at Range 30, Confidence Course (Firing Line), Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; and Former Grenade Range/Area, Parcel 106Q-X at Fort McClellan, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. In addition, three ranges described in the Archive Search Report (ASR) will also be investigated as part of this investigation: Tank Sub-Caliber Range/Carbine Transition Range/Machine Gun Range, Grenade Court, and Unnamed Small Arms Range. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at these parcels and ranges.

Parcels 88Q, 102Q, and 106Q-X are located in the northern part of the Main Post of Fort McClellan, east of Reilly Airfield. The range fan for Parcel 88Q covers an area of approximately 545 acres. The range fans for Parcels 102Q and 106Q-X cover approximately 13 and 10 acres, respectively. However, the area of investigation for this SI will be limited to approximately 34 acres. The area of investigation incorporates all of Parcel 106Q-X; that portion of Parcel 88Q located north of the Fill Area at Range 30, Parcel 231(7) and an adjacent unpaved road; and that portion of Parcel 102Q located northwest of Parcel 231(7). Parcel 88Q occupies both the north and south sides of Falcon Road. The southeastern portion of Parcel 88Q, which includes the range's likely impact area, will be addressed separately. A small portion of the area of investigation to the northwest overlaps the area of investigation for the Fill Area East of Reilly Airfield, Parcel 227(7). In addition, a portion of the area of investigation to the southeast overlaps the Fill Area at Range 30, Parcel 231(7). Therefore, data collected for the SI at Parcels 227(7) and 231(7) will be incorporated into the SI for Parcel 88Q, 102Q, and Parcels 106Q-X, where appropriate.

In addition to Parcels 88Q, 102Q, and 106Q-X described in the EBS, three other ranges or areas shown on Plates 5, 6, and 10 of the *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama* are included in this SI.

IT will collect 39 surface soil samples, 33 subsurface soil samples, 5 groundwater samples, 3 surface water samples, and 3 sediment samples at this site. Potential contaminant sources at Parcel 88Q, 102Q, and Parcel 106Q-X, are primarily unknown but may include explosive compounds and metals. All samples collected during the SI will be analyzed for explosives and

metals. Ten percent of the samples collected will also be analyzed for volatile organic compounds, semivolatile organic compounds, pesticides, and herbicides. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with site-specific screening levels, ecological screening values, and background values to determine if potential site-specific chemicals are present at the site at concentrations that pose an unacceptable risk to human health or the environment

1.0 Project Description

1.1 Introduction

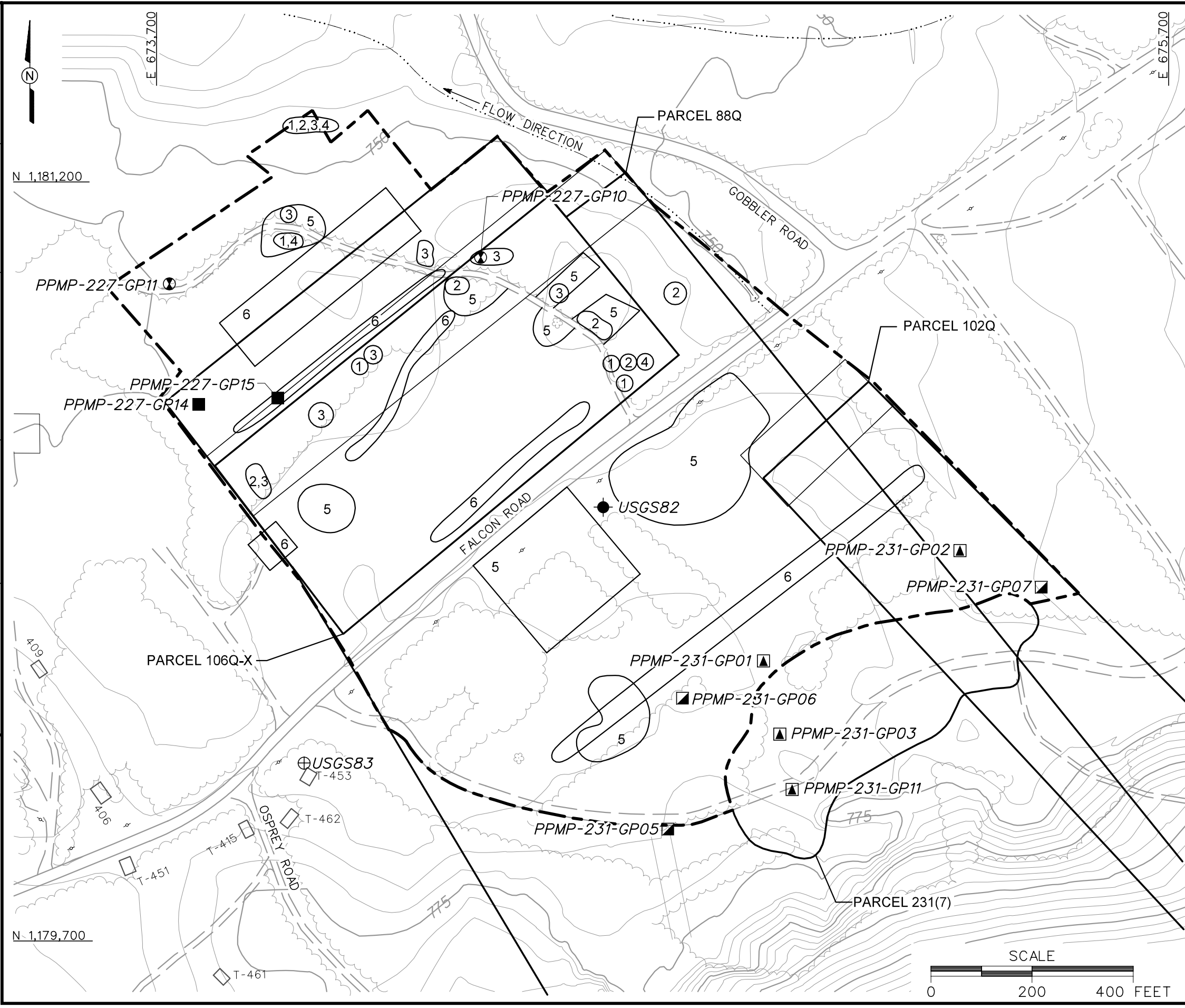
The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of Range 30, Confidence Course (Firing Line), Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; and Former Grenade Range/Area, Parcel 106Q-X; under Task Order CK10, Contract Number DACA21-96-D-0018. In addition, three ranges described in the Archive Search Report (ASR) will also be investigated as part of this task: Tank Sub-Caliber Range/Carbine Transition Range/Machine Gun Range, Grenade Court, and Unnamed Small Arms Range.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) for FTMC (IT, 2000a) has been prepared to provide technical guidance for sample collection and analysis at an area of investigation encompassing portions of Parcels 88Q, 102Q, and 106Q-X. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) and the site-specific unexploded ordnance (UXO) safety plan developed for Parcels 88Q, 102Q, and 106Q-X, the installation-wide work plan (IWWP) (IT, 1998), and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP.

1.2 Site Description

Parcels 88Q, 102Q, and 106Q-X are located in the northern part of the Main Post of FTMC, east of Reilly Airfield (Figure 1-1). Parcels 88Q, 102Q, and 106Q-X are the primary ranges of concern for the area of investigation as defined in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Although the range fans for Parcels 88Q and 106Q-X cover a much larger area, this SI will be limited to an approximately 34-acre area, that incorporates all of Parcel 106Q-X, approximately one-third of Parcel 102Q, and that portion of Parcel 88Q located northwest of Fill Area at Range 30, Parcel 231(7) and an adjacent dirt road (Figure 1-2).

Parcel 88Q. Range 30, Confidence Course, Parcel 88Q, is located in the northern part of the Main Post and was used from 1977 to between 1983 and 1989 (ESE, 1998). The entire area



LEGEND

UNIMPROVED ROADS AND PARKING

PAVED ROADS AND PARKING

TOPOGRAPHIC CONTOURS
(CONTOUR INTERVAL - 5 FOOT)

TREES / TREELINE

AREA OF INVESTIGATION

FIRING LINES

SURFACE DRAINAGE / CREEK

UTILITY POLE

EXISTING USGS BEDROCK MONITORING
WELL LOCATION

EXISTING USGS RESIDUUM MONITORING
WELL LOCATION

EXISTING SURFACE AND SUBSURFACE
SOIL SAMPLE LOCATION

EXISTING SURFACE SOIL SAMPLE
LOCATION

EXISTING GROUNDWATER AND
SUBSURFACE SOIL SAMPLE LOCATION

EXISTING GROUNDWATER, SURFACE AND
SUBSURFACE SOIL SAMPLE LOCATION

- TRAINING AIDS/PHYSICAL FEATURES OBSERVED
- ①

MISCELLANEOUS DEBRIS
- ②

MOUNDS
- ③

DEPRESSIONS
- ④

METAL DEBRIS
- ⑤

FORMER DISTURBED AREA INDENTIFIED
FROM AERIAL PHOTOGRAPHS
- ⑥

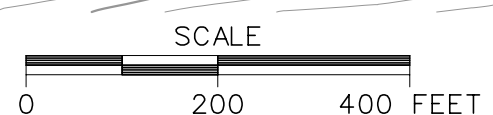
FORMER BERM LOCATIONS IDENTIFIED
FROM AERIAL PHOTOGRAPHS

FIGURE 1-2

SITE MAP

RANGE 30, CONFIDENCE COURSE
(FIRING LINE), PARCEL 88Q
FORMER RIFLE/MACHINE GUN RANGE,
PARCEL 102Q
FORMER GRENADE RANGE/AREA,
PARCEL 106Q-X

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018



occupied by Range 30 is approximately 545 acres. The portion of Parcel 88Q that is the subject of this SI is bounded by Reilly Airfield to the west and Parcel 231(7) and an unpaved road to the south. The range was inactivated sometime between 1983 and 1989. Ordnance fired at this range consisted of M-16 blanks, flares, and simulators (ESE, 1998). Historically, M-60 and .30-caliber ordnance were used (Bragg and Davis, 1995, 1996). Range 30 was used for end-of-cycle training and has not been used since the mid to late 1980s (Case, 1995, 1996) (ESE, 1998). End-of-cycle tests were the last phase of basic training prior to graduation.

Based on the location of Reilly Airfield to the west of Range 30, the position of the firing line, and the orientation of the range fan presented in the EBS, the direction of fire was most likely to the southeast. The impact area is not identified in the EBS. However, based on the probable direction of fire, the impact area is most likely the hillside southeast of the area of investigation. The probable Range 30 impact area will be addressed under a separate investigation.

Ground surface at Parcel 88Q is relatively flat with only a slight slope to the northwest. The overall elevation ranges from approximately 750 to 760 feet above mean sea level (msl). Surface drainage is located along the northeastern portion of the parcel and flows to the northwest, eventually emptying into Reilly Lake (Figure 1-2).

Parcel 102Q. According to the EBS, Former Rifle/Machine Gun Ranges, Parcel 102Q is one of seven former rifle/machine gun ranges that were identified in the northern part of the Main Post. The dates of operation and types of ordnance fired at these ranges are unknown. According to historical maps, four ranges were in use in 1917. However, it is unclear which four of the seven former ranges were active at that time. The remaining three ranges appear on later historical maps (1959 and 1966).

Based on the orientation of the firing lines and range fans presented in the EBS, the direction of fire for Parcel 102Q was to the southeast. Impact areas for these ranges were not identified in the EBS. Based on the orientation of the firing lines and range fans, the most likely impact area is the hillside located southeast of the firing lines (Figure 1-2). The likely impact area for Parcel 102Q will be addressed in additional investigations.

Parcel 102Q is located south of Falcon Road near its intersection with Gobbler Road. The topography in the area of investigation gently slopes to the northwest. The elevation across this area ranges between 760 to 780 feet above msl. A small, unnamed intermittent stream flows

northwest through the northwestern corner of the area of investigation, eventually emptying into Reilly Lake.

Observed during site walks conducted by IT personnel in October 2001: a majority of the area of investigation was covered with grass, with the exception of shrubs and trees growing along the western boundary and another strip of shrubs and trees located to the east of the firing line for Parcel 102Q.

Parcel 106Q-X. The Former Grenade Range/Area, Parcel 106Q-X, was identified in the northern part of the Main Post on a 1959 map. The exact size of the range, the types of ordnance used, and the operational dates are not known (ESE, 1998). Parcel 106Q-X is approximately 10 acres in size and overlaps Parcel 88Q. The EBS identified the impact area for Parcel 106Q-X to be in the southern portion of the parcel, within the area of investigation for this SI. No impact areas were noted during an October 2001 site walk by IT personnel. Review of available aerial photographs did not confirm the presence of the Former Grenade Range/Area.

Parcel 106Q-X is generally flat, with an elevation of approximately 750 feet above msl. Surface drainage is located along the northeastern portion of the parcel and flows to the northwest eventually emptying into Reilly Lake. During site walks were conducted by IT personnel in October 2001, high grass, thick shrubs, and dense woods were observed to cover most of the area of investigation. In the southeastern corner of Parcel 88Q, miscellaneous debris and a few small mounds were noted. The debris consisted of cinder blocks, sandbags, and one 5-gallon can. Along the eastern portion of Parcel 88Q, several small mounds and depressions were noted. A majority of these mounds and depressions appeared to be old foxholes.

Along the northeastern boundary of Parcels 88Q and 106Q-X, mounds were found containing miscellaneous debris consisting of pieces of concrete, stone, and metal. This area appears to be associated with the Fill Area East of Reilly Airfield, Parcel 227(7). Three temporary monitoring wells installed as part of the investigation at Parcel 227(7) were encountered during the site walk.

Immediately north of Parcel 106Q-X, several small depressions and one mound with metal debris (consisting of corrugated metal pipe and razor wire) were found during the site walk. Along the firing line for Parcel 88Q, several additional small mounds and depressions were noted. A majority of the depressions and mounds appeared to be old foxholes. No berms or other evidence suggesting an impact area were noted during the October 2001 site walk at Parcels 88Q and 106Q-X.

Archives Search Report Ranges. In addition to Parcels 88Q, 102Q, and 106Q-X described in the EBS, three other ranges (areas) are shown in the area of this investigation on Plates 5, 6, and 10 of the *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama* (ASR) (USACE, 1999a). Figure 1-3, taken from the ASR map plates, shows the additional ranges present in the area of investigation are primarily from World War II through 1973. Represented plates from the ASR are:

- Plate 5 – World War II to 1950 Range Use
- Plate 6 – 1950 to 1973 Range Use
- Plate 10 – Cumulative Map of All Ranges (circa 1915 to 1996).

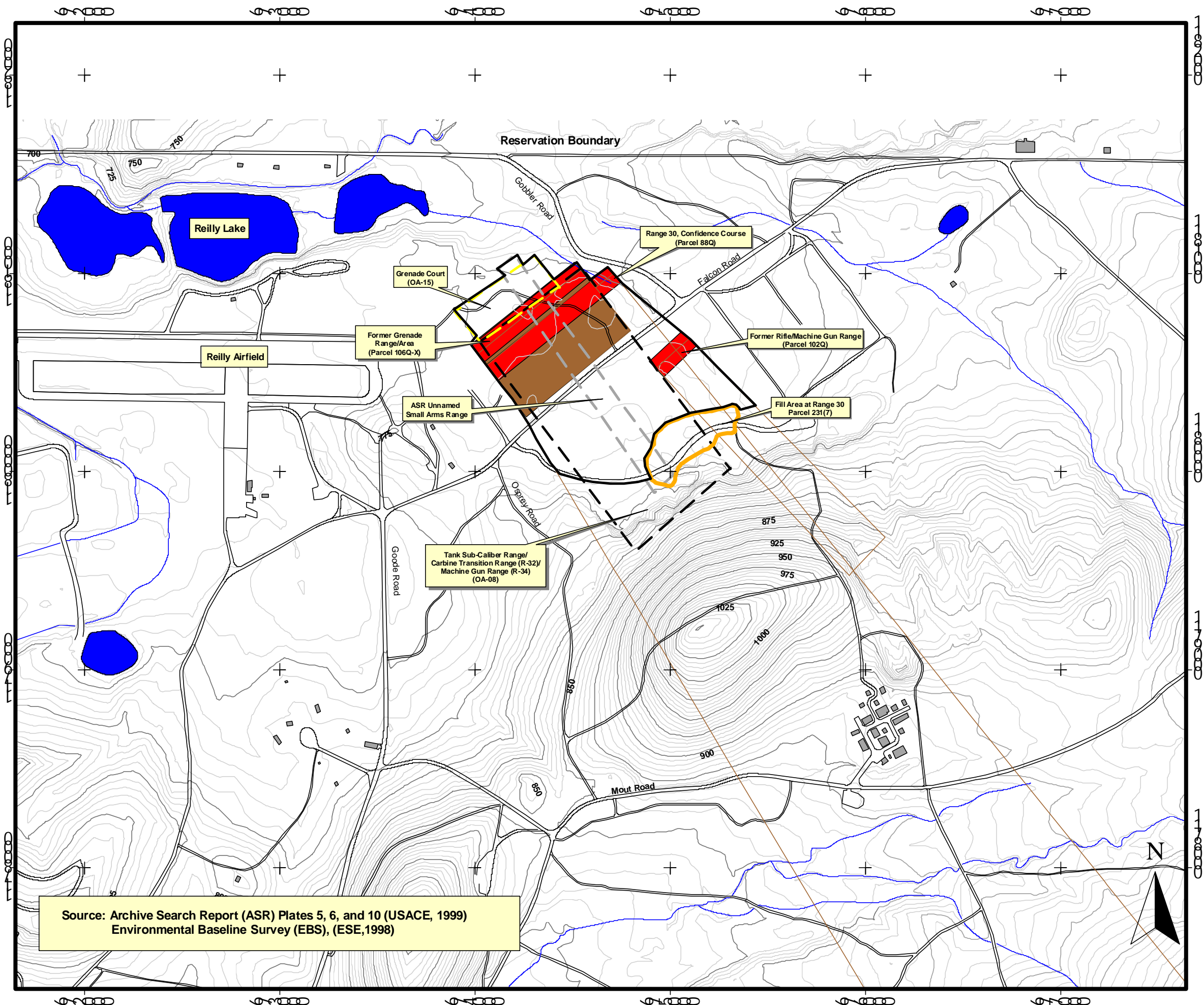
Table 1-1 briefly describes the ASR ranges and impact areas. Only two of these ranges (Tank Sub-Caliber Range/Carbine Transition Range [R-32]/ Machine Gun Range [R-34], hereinafter referred to as OA-08, and Grenade Court [OA-15]) are described in the ASR. The other range is not named or described in the ASR and is referred to as an Unnamed Small Arms Range.

Tank Sub-Caliber/Carbine Transition (R-32)/ Machine Gun Range (R-34) or OA-08.

OA-08 overlaps Parcels 88Q and 106Q-X and extends on both the north and south sides of Falcon Road (Figure 1-3). According to the ASR, OA-08 underwent at least three transitions between World War II and 1973. During the 1950s, sub-caliber devices for use in tank main guns, including 37mm ammunition with black powder charges, were fired from 14 firing points. By 1958, the range had changed into a Carbine Transition Range (R-32). Before 1967, the range was used for machine gun field firing (R-34) (USACE, 1999a). The maps indicate that the range layout has changed often resulting in various orientations.

Based on the position of Reilly Airfield to the west and the orientation of the range fan, the most likely direction of fire from these ranges would have been to the southeast. The ASR does not identify the impact area for OA-08. However, based on the orientation of the ranges, the impact area appears to be the hillside south of Falcon Road (Figure 1-3). The portion of OA-08 located north of Parcel 231(7) and an adjacent dirt road will be addressed in this SI. The portion of the range located south of the dirt road and Parcel 231(7) will be addressed separately.

The Grenade Court (OA-15). The Grenade Court (OA-15) is shown on Plate 6 in the ASR. The Grenade Court is located north of Parcel 88Q and partially overlaps Parcel 106Q-X. According to the ASR, the Grenade Court was used during World War II and was abandoned by



Source: Archive Search Report (ASR) Plates 5, 6, and 10 (USACE, 1999)
Environmental Baseline Survey (EBS), (ESE,1998)

Figure 1-3

Range Location Map

Legend

- EBS Firing Lines
- EBS Impact Areas
- EBS Range Fan
- Area of Investigation
- Tank Sub-Caliber Range/Carbine Transition Range (R-32)/ Machine Gun Range (R-34) (OA-08)
- Grenade Court (OA-15)
- ASR Unnamed Small Arms Range
- Fill Area at Range 30 Parcel 231(7)
- Streams
- Roads
- 5 Foot Topographic Contours
- Buildings
- Lake

500 0 500 Feet
State Plane Feet, NAD83

Table 1-1

**ASR Range Descriptions
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

Range Name	ASR Number	Site Description	Plate 5 ^a	Plate 6 ^a	Plate 10 ^a	Impact Area Location
Tank Sub-Caliber Range/ Carbine Transition Range (R-32)/ Machine Gun Range (R-34)	OA-08	This range went under at least three transitions between World War II and 1973. According to the ASR, during the 1950's sub-caliber devices for use in tank main guns, including 37mm ammunition with black powder charges, were fired from 14 firing points. By 1958, the range was changed into a Carbine Transition Range (R-32). Before 1967, the range was used for machine gun field firing (R-34). Maps indicate the range layout has changed often with different orientations. Based on the location of Reilly Airfield to the northeast and the location firing line of Parcel 88Q in the EBS the most likely direction of fire from these ranges would have been to the southeast.	X	X	X	The impact area is not identified by the ASR. However, based on the orientation of the range the most likely impact location is the hillside south of Falcon Road. This area will be addressed separately.
Grenade Court	OA-15	According to the ASR, the Grenade Court was used during World War II. The 1950 range map shows the range as a Hand Grenade Court with 12 bays. By 1958, the Grenade Court has been abandoned. The location of the Grenade Court appears to coincide with the EBS former Grenade Range/Areas Parcel 106Q-X.		X	X	The ASR does not identify the impact area. A likely impact area could not be inferred from the orientation of the range, determined from the review of the available aerial photographs or by observations made during the site walk by IT personnel in October 2001.
ASR Unnamed Small Arms Range	NA	ASR Unnamed Small Arms Range appears on the electronic file for Plate 5 (not on the hard copy included in the ASR). Plate 5 represents the time period from World War II to 1950. Based on the orientation of the range fan, the firing line appears to be north of Falcon Road and the impact are south of Falcon Road terminating at the base of a hill. This small arms range has a similar orientation as Parcels 88Q and 102Q.	X Electronic File Only.		X	The impact area is not identified by the ASR. However, based on the location of Reilly Airfield and the orientation of the range the most likely impact location is the hillside south of Falcon Road.

^a Corresponds to the map plate number from the July 1999 USACE **Archive Search Report, Maps, Fort McClellan, Anniston, Alabama**.

NA - Not assigned a parcel number or described in the EBS or ASR.

ASR - **Archive Search Report, Maps, Fort McClellan, Anniston, Alabama**, USACE, July 1999.

X - Denotes the figure where the listed range is shown in this SFSP. Figure 1-3 shows the historic ranges from the ASR (also shows the EBS parcels).

1958. The 1950 range map shows the range as a Hand Grenade Court with 12 bays (USACE, 1999a). The location of the Grenade Court appears to coincide with the general location of the Former Grenade Range/Area, Parcel 106Q-X, described in the EBS. The firing line and impact area were not identified in the ASR, and could not be determined from the orientation of the range or from a review of available aerial photographs.

Unnamed Small Arms Range. The Unnamed Small Arms Range does not appear on the hard-copy (paper) version of ASR Plate 5. However, the range is depicted in the electronic file version. The range also appears on the hard-copy version of Plate 10 of the ASR as part of the cumulative map of all ranges for FTMC. The small arms range is oriented northwest-southeast, overlapping Parcels 88Q and 106Q-X (Figure 1-3).

Based on the position of Reilly Airfield to the west and the location of the firing line of Parcel 88Q, the most likely direction of fire at the small arms range would have been to the southeast across Falcon Road. The ASR does not identify the impact area for the small arms range. However, based on the orientation of the range, the impact area appears to be the base of the hill located south of Falcon Road. The extreme southeastern portion of the unnamed small arms range was located within the Fill Area at Range 30, Parcel 231(7), and was investigated as a part of the SI for Parcel 231(7).

1.2.1 Aerial Photographs

Available aerial photographs were reviewed to reveal any land-use activity in the area of investigation. Upon review of these aerial photographs, it was not possible to match the FTMC range-use records in the EBS and ASR with observations made from the aerial photographs. The following is a summary of the review of available aerial photographs.

1937, 1940, and 1944. These aerial photographs show the area of investigation covered with grass with a significant number of disturbed areas. However, the photographs did not show a distinct land-use activity.

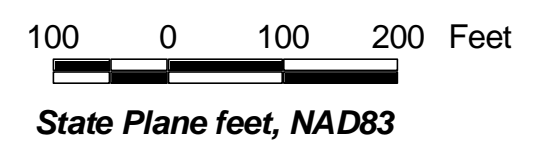
1954. The 1954 aerial photograph shows the area of investigation to be mostly covered with grass (Figure 1-4). Numerous disturbed areas were noted across the area of investigation, suggesting ongoing activity. One notable item on this aerial photograph is a circular feature located in the west-central portion of the area of investigation. Approximately four berms were observed just east of this circular feature. One large berm and several smaller berms were also



Figure 1-4
1954 Aerial Photograph
Range 30, Confidence
Course (Firing Line),
Parcel 88Q, Former Rifle/
Machine Gun Range,
Parcel 102Q and Former
Grenade Range/Area
Parcel 106Q-X

Legend

- Area of Investigation
- EBS Range Fan
Range 30,
Confidence Course
Parcel 88Q
- EBS Range Fan Former
Rifle/Machine Gun
Range, Parcel 102Q
- - - EBS Range Fan
Former Grenade
Range/Area
Parcel 106Q-X



This map employs uncontrolled aerial photographs. The resulting distortions affect the spatial accuracy of the photographs. Therefore the photographs are used for reference only.

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Mobile District
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Calhoun County, Alabama
Contract No. DACA21-96-D-0018



noted in the northern portion of the area of investigation and south of the dirt road (Falcon Road) dividing the site.

1961. The 1961 aerial photograph shows an increase in vegetative cover across the area of investigation, suggesting a decrease in activity between 1954 and 1961 (Figure 1-5). In addition, the photograph shows that flight-path clearing for Reilly Airfield had extended into the area of investigation, although no paved runway extensions are present. The circular feature noted on the 1954 aerial photograph is not present in this aerial photograph. However, the berms noted in the 1954 aerial photograph are still present.

1964. The 1964 aerial photograph shows further increase in the vegetative cover across the area of investigation, suggesting a continued decrease in activity. However, it appears that improvements were made to Reilly Airfield between 1961 and 1964, and the clearing for the airfield's fly-over no longer extends into the area of investigation. The berms seen in the 1954 and 1961 aerial photographs are no longer visible.

1969. The 1969 aerial photograph shows that, between 1964 and 1969, the trees and shrubs were removed from immediately west of the area of investigation to Gobbler Road. The area has been graded and seeded with grass.

1973. The 1973 photograph appears very similar to the 1969 photograph. The area remains covered with grass. A linear, man-made feature is noted along the eastern boundary of the area of investigation. During the site walk in October 2001, a man-made surface drain was noted in the approximate location as the linear feature observed in this photograph.

1976. The 1976 aerial photograph shows a new area of activity along the southern portion of the area of investigation. In this area, the vegetation has been cleared, and two roads and a berm have been constructed parallel to Falcon Road (Figure 1-6).

1982. The 1982 aerial photograph shows an additional berm and dirt road constructed north of Falcon Road (Figure 1-7). Four new disturbed areas are also observed on this photograph. The berm extends southwest to northeast across the center portion of the area of investigation. The road on this photograph extends across the northern and eastern portions of the area of investigation. Much of the disturbed areas are found along the newly identified road. A kidney-shaped cleared area can be found in the south-central portion of the area of investigation.

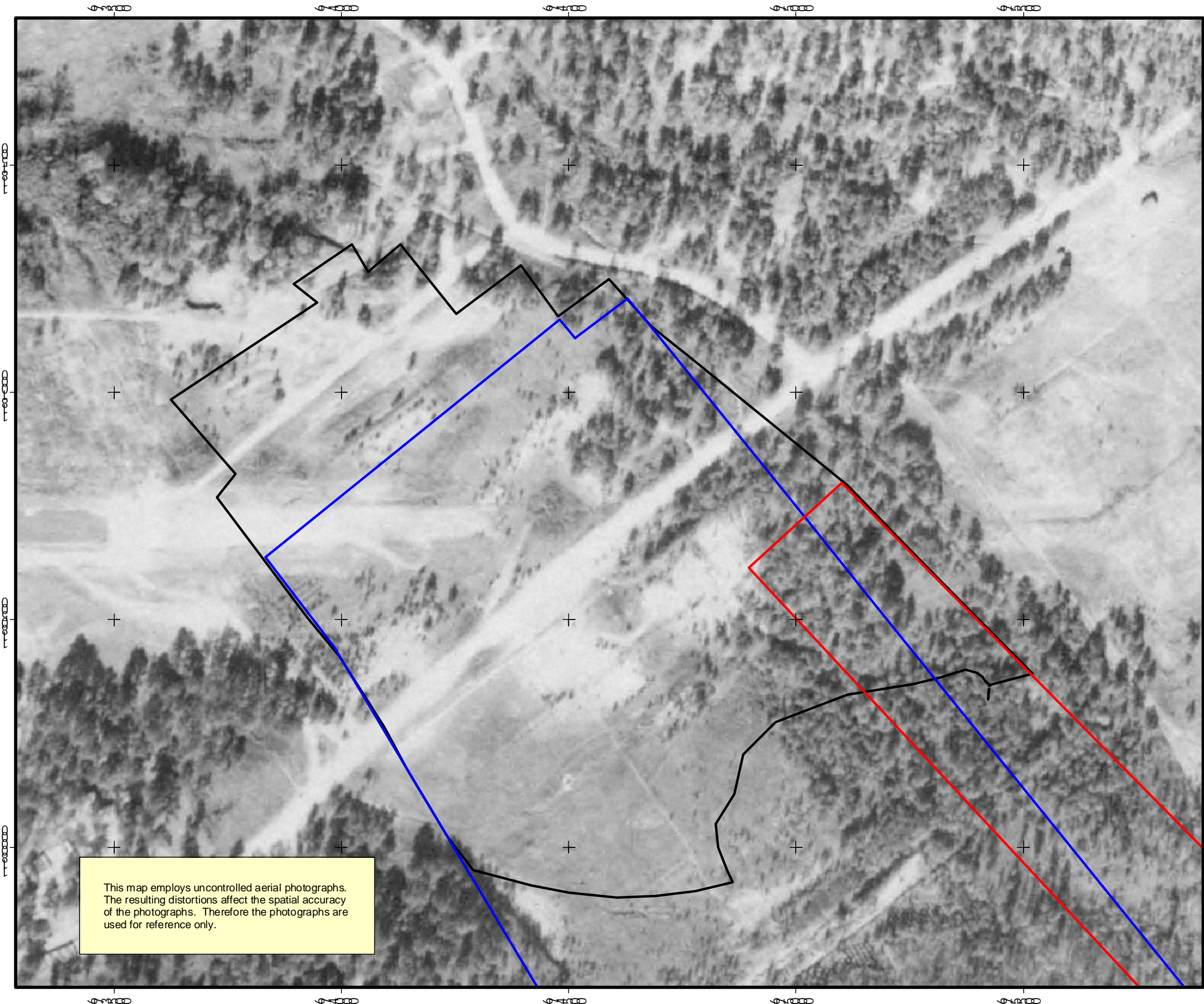


Figure 1-5

1961 Aerial Photograph
Range 30, Confidence
Course (Firing Line),
Parcel 88Q, Former Rifle/
Machine Gun Range,
Parcel 102Q and Former
Grenade Range/Area
Parcel 106Q-X

Legend

- Area of Investigation
- EBS Range Fan
Range 30,
Confidence Course
Parcel 88Q
- EBS Range Fan Former
Rifle/Machine Gun
Range, Parcel 102Q
- EBS Range Fan
Former Grenade
Range/Area
Parcel 106Q-X

100 0 100 200 Feet

State Plane feet, NAD83



U.S. Army Corps of Engineers
Mobile District
Fort McClellan
Calhoun County, Alabama
Contract No. DACA21-96-D-0018





This map employs uncontrolled aerial photographs. The resulting distortions affect the spatial accuracy of the photographs. Therefore the photographs are used for reference only.

Figure 1-6
1976 Aerial Photograph
Range 30, Confidence
Course (Firing Line),
Parcel 88Q, Former Rifle/
Machine Gun Range,
Parcel 102Q and Former
Grenade Range/Area
Parcel 106Q-X

Legend

- Area of Investigation
- EBS Range Fan
Range 30,
Confidence Course
Parcel 88Q
- EBS Range Fan Former
Rifle/Machine Gun
Range, Parcel 102Q
- - - EBS Range Fan
Former Grenade
Range/Area
Parcel 106Q-X

100 0 100 200 Feet

State Plane feet, NAD83

N

U.S. Army Corps of Engineers
Mobile District
Fort McClellan
Calhoun County, Alabama
Contract No. DACA21-96-D-0018





This map employs uncontrolled aerial photographs. The resulting distortions affect the spatial accuracy of the photographs. Therefore the photographs are used for reference only.

Figure 1-7
1982 Aerial Photograph
Range 30, Confidence
Course (Firing Line),
Parcel 88Q, Former Rifle/
Machine Gun Range,
Parcel 102Q and Former
Grenade Range/Area
Parcel 106Q-X

Legend

- Area of Investigation
- EBS Range Fan Range 30, Confidence Course Parcel 88Q
- EBS Range Fan Former Rifle/Machine Gun Range, Parcel 102Q
- - - EBS Range Fan Former Grenade Range/Area Parcel 106Q-X



U.S. Army Corps of Engineers
Mobile District
Fort McClellan
Calhoun County, Alabama
Contract No. DACA21-96-D-0018



1994. The 1994 aerial photograph is very similar to the 1982 photograph. An increase in vegetative cover is noted across the area of investigation and the disturbed areas identified in the 1982 photograph are now overgrown with vegetation.

1998. The 1998 aerial photograph shows a majority of the area of investigation to be covered with trees and shrubs. However, the southern portion of the area of investigation appears to have been graded and seeded with grass.

1.2.2 Soil Types

Soils found within the area of investigation for this SI are the Cumberland gravelly loam and Anniston gravelly clay loam. The Cumberland gravelly loam underlies the majority of the area of investigation, with only a small portion of the southeast corner of the area underlain by the Anniston gravelly loam (U.S. Department of Agriculture [USDA], 1961).

The Cumberland gravelly loam has generally developed in old alluvium that washed from soils derived mainly from limestone, cherty limestone, shale, and sandstone. The surface soil of the Cumberland gravelly loam ranges from very dark brown to reddish brown. The subsoil ranges from dark red to red in color and from silt clay loam to clay in texture. The thickness of the alluvium ranges from 2 to greater than 15 feet. Some areas included in this soil mapping unit have a silt loam to gravelly fine sandy loam surface soil which is generally underlain in places by beds of gravel or sand. Rounded chert, sandstone, and quartz gravel, as much as 3 inches in diameter, can be found throughout this soil. Infiltration of this soil type is medium, permeability moderate, and the capacity for available moisture is high (USDA, 1961).

The Anniston gravelly clay loam consists of friable, medium to strongly acidic, deep, well-drained soils that have developed in old local alluvium on the foot slopes and along the base of larger hills in the region. The parent material for the Anniston gravelly clay loam is washed from the adjacent, higher-lying Linker, Muskingum, Enders, and Montevallo soils, which developed from weathered sandstone, shale, and quartzite. Sandstone and quartzite gravel, cobbles, and fragments as much as 8 inches in diameter are on the surface and throughout the soil. The color of the Anniston gravelly clay loam surface soil ranges from dark brown and very dark brown to reddish brown and dark reddish brown. The texture of subsoil ranges from light clay loam to clay or silty clay loam. The alluvium ranges in thickness from 2 feet to more than 8 feet.

Infiltration and runoff are medium, permeability is moderate, and the capacity for available moisture is high. Organic matter is moderately low (USDA, 1961).

Bedrock Geology. Bedrock beneath the area of investigation for this SI is mapped as the Cambrian Conasauga Formation (Osborne et al., 1997). The Cambrian Conasauga Formation is composed of dark gray, finely to coarsely crystalline, medium to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

1.3 Scope of Work

The scope of work for SI activities at Parcels 88Q, 102Q, and 106Q-X, and the three ASR ranges, as specified by the statement of work (USACE, 1999b), includes the following tasks:

- Develop the SFSP and SSHP attachments.
- Conduct a surface and near-surface UXO survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect 39 surface soil samples, 33 subsurface soil samples, 5 groundwater samples, 3 surface water samples, and 3 sediment samples to determine whether potential site-specific chemicals (PSSC) are present at the site, and to provide data useful for supporting any future corrective measures and closure activities.
- Analyze samples for the parameters listed in Section 4.5.

Parcels 88Q, 102Q, and 106Q-X fall within the “Possible Ordnance Impact Areas” shown on Plate 10 of the ASR (USACE, 1999a). Therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance. The site-specific UXO safety plan will be used to support sample collection activities at Parcels 88Q, Parcel 102Q, and Parcel 106Q-X, should incidental ordnance, explosives, or UXO be encountered and require avoidance.

At completion of the field activities and sample analyses, draft and final SI summary reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. SI reports will be prepared

in accordance with current U.S. Environmental Protection Agency (EPA), Region IV, and Alabama Department of Environmental Management (ADEM) guidelines.

2.0 Summary of Existing Environmental Studies

2.1 Environmental Baseline Survey

The EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by the following seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require further evaluation.

For non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) environmental or safety issues, the parcel label includes the following components: a unique non-CERCLA issue number, the letter "Q" designating the parcel as a Community Environmental Response Facilitation Act (CERFA) Category 1 Qualified Parcel, and the code for the specific non-CERCLA issue(s) present (ESE, 1998). The non-CERCLA issue codes used are:

- A = Asbestos (in buildings)
- L = Lead-based paint (in buildings)

- P = Polychlorinated biphenyls
- R = Radon (in buildings)
- RD = Radionuclides/radiological issues
- X = UXO
- CWM = Chemical warfare material.

The EBS was conducted in accordance with CERFA protocols (CERFA-Public Law 102-426) and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of CERCLA-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Parcels 88Q, 102Q, and 106Q-X were identified as Category 1 CERFA sites. These CERFA sites are parcels where no known or recorded storage, release, or disposal (including migration) of hazardous substances or petroleum products has occurred on site property. However, the parcels are qualified because the sites were active ranges. These parcels require additional evaluation to determine their environmental condition.

IT previously investigated three parcels that partially overlap or are adjacent to the area of investigation for this SI, as briefly summarized in the following sections.

2.2 Site Investigation at Parcels 227(7) and 126(7)

The Fill Area East of Reilly Airfield, Parcel 227(7), and the Post Garbage Dump, Parcel 126(7), are located northeast of the area of investigation. A small portion of 227(7) overlaps the northwestern area of this investigation.

IT conducted a geophysical survey at the Fill Area East of Reilly Airfield, Parcel 227(7) and the Former Post Garbage Dump, Parcel 126(7) from September 1998 to March 1999 (IT, 2001). The total area surveyed was about 32 acres. The geophysical survey located large-scale disposal areas, landfill pits, anomalous high conductivity areas, isolated buried metallic objects, and surface metallic debris.

Thirteen temporary wells were installed in the residuum groundwater zone at the Fill Area East of Reilly Airfield and three temporary wells were installed at the Former Post Garbage Dump. Surface soil samples were collected from six locations and depositional soil samples were collected from seven locations at the Former Post Garbage Dump and the Fill Area East of Reilly Airfield.

Surface and subsurface soils, groundwater, and surface water/sediment were sampled and analyzed as part of the investigation. Complete analytical results can be found in the *Fill Area Definition Report*, (IT, 2001).

Fill Area Definition. Seventeen exploratory trenches were excavated at the Fill Area East of Reilly Airfield and the Former Post Garbage Dump to characterize the horizontal and vertical extent of the fill material (IT, 2001). Trenches were excavated to depths ranging from 10 to 15 feet bgs. Fill material typical of a landfill was observed in 16 of the 17 trenches.

Five borings were installed at the Fill Area East of Reilly Airfield and the Former Post Garbage Dump to investigate the depth of fill material and to identify COPCs within the fill material. Fill material borings were installed to depths ranging from 10 to 18 feet bgs.

IT has estimated the vertical and horizontal extent of the waste fill at the Fill Area East of Reilly Airfield and the Former Post Garbage Dump based on information gathered from the site investigation and trenching and boring activities discussed in this report. The approximate horizontal extent of fill in both parcels covers 6.4 acres. The average depth of fill material estimated from the trench and boring log data is 8 feet at the Fill Area East of Reilly Airfield and 3 feet at the Former Post Garbage Dump (IT, 2001).

2.3 Site Investigation at Parcel 231(7)

The Fill Area at Range 30, Parcel 231(7) borders the area of this investigation to the southeast. Eleven soil borings and four temporary groundwater monitoring wells were installed as part of the SI conducted by IT at the Fill Area at Range 30, Parcel 231(7) (IT, 2001). Surface and subsurface soils, groundwater, and surface water/sediment were sampled and analyzed as part of the investigation. Complete analytical results can be found in the *Fill Area Definition Report*, (IT, 2001).

Fill Area Definition. IT installed two fill material borings and collected fill samples at Parcel 231(7) in March 2000 to characterize the waste fill (IT, 2001). Six exploratory trenches were excavated at the Fill Area at Range 30. Trenches were excavated at depths ranging from 2.5 to 8 feet bgs.

Fill material was observed in five of the six trenches and included: metal pipes and straps, glass, red bricks, reddish-orange sand and silt, light brown silt, cobbles, black coal, orange/red sand and clay, plastic chip bag, plastic sheeting, beer cans, styrofoam, plastic oil containers, corrugated pipe, concrete chunks, ceramic pieces, tree limbs, carpet, and plastic trash bags.

IT has estimated the vertical and horizontal extent of fill material at the Fill Area at Range 30 based on information gathered from previous site investigations and trenching and boring activities discussed in this report. The fill area covers approximately 3.9 acres. The average depth of fill material estimated from the trench and boring log data is approximately 4 feet bgs (IT, 2001).

Table 2-1 shows groundwater elevations from March 2000 for Parcels 227(7) and 231(7). In addition, monitoring well construction data is located in Table 2-2 for Parcels 227(7) and 231(7). A potentiometric surface map is shown on Figure 2-1 for the Parcels 227(7) and 231(7) areas.

Table 2-1

**Groundwater Elevations, Parcels 227(7) and 231(7)
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

Well Location	Measurement Date	Depth to Water (ft BTOC)	Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Water Elevation (ft amsl)
PPMP-227-GP01	13-Mar-00	25.25	753.71	751.83	728.46
PPMP-227-GP02	13-Mar-00	24.60	749.53	747.55	724.93
PPMP-227-GP03	13-Mar-00	29.94	751.43	748.60	721.49
PPMP-227-GP04	13-Mar-00	28.35	751.58	749.45	723.23
PPMP-227-GP05	13-Mar-00	26.58	750.36	747.10	723.78
PPMP-227-GP06	13-Mar-00	3.27	731.30	729.15	728.03
PPMP-227-GP07	13-Mar-00	31.40	760.08	759.08	728.68
PPMP-227-GP08	13-Mar-00	20.00	741.29	738.46	721.29
PPMP-227-GP09	13-Mar-00	9.75	751.31	749.90	741.56
PPMP-227-GP10	13-Mar-00	32.05	763.19	760.89	731.14
PPMP-227-GP11	13-Mar-00	30.28	759.38	758.76	729.10
PPMP-227-GP12	13-Mar-00	33.75	762.00	759.11	728.25
PPMP-227-GP13	13-Mar-00	26.38	755.50	753.79	729.12
PPMP-231-GP01	13-Mar-00	32.26	767.41	765.60	735.15
PPMP-231-GP02	13-Mar-00	20.38	770.91	770.57	750.53
PPMP-231-GP03	13-Mar-00	37.13	770.71	769.30	733.58
PPMP-231-GP11	13-Mar-00	38.80	774.08	773.79	735.28

Elevations referenced to the North American Vertical Datum of 1988.

BTOC - Below top of casing.

ft - Feet.

amsl - Above mean sea level.

Table 2-2

**Well Construction Data, Parcels 227(7) and 231(7)
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

Well Location	Northing	Easting	Ground Elevation (ft amsl)	TOC Elevation (ft amsl)	Total Depth (ft bgs)	Screen Length (ft bgs)	Screen Interval (ft bgs)
PPMP-227-GP01	1180764.49	673161.15	751.83	753.71	34	15	18.25 - 33.25
PPMP-227-GP02	1180902.49	672542.59	747.55	749.53	30	15	14.25 - 29.25
PPMP-227-GP03	1181164.45	672599.45	748.60	751.43	31	15	15.75 - 30.75
PPMP-227-GP04	1181059.82	672933.44	749.45	751.58	32	15	16.5 - 31.5
PPMP-227-GP05	1181317.03	672953.27	747.10	750.36	30.25	15	15.0 - 30.0
PPMP-227-GP06	1181473.90	673323.99	729.15	731.30	8	7	0.5 - 7.5
PPMP-227-GP07	1181247.24	673514.61	759.08	760.08	34	15	18.50 - 33.50
PPMP-227-GP08	1181422.85	673999.48	738.46	741.29	11.5	10	NA
PPMP-227-GP09	1181345.05	674153.60	749.90	751.31	26	15	NA
PPMP-227-GP10	1181047.79	674343.49	760.89	763.19	33	15	17.5 - 32.5
PPMP-227-GP11	1180995.29	673728.39	758.76	759.38	34	25	8.25 - 33.25
PPMP-227-GP12	1181111.25	673465.86	759.11	762.00	42.5	25	17.0 - 42.0
PPMP-227-GP13	1180894.93	673377.15	753.79	755.50	38	15	22.75 - 37.75
PPMP-231-GP01	1180250.12	674902.70	765.60	767.41	39	15	23.0 - 38.0
PPMP-231-GP02	1180468.27	675290.82	770.57	770.91	35	15	19.5 - 34.5
PPMP-231-GP03	1180105.56	674934.89	769.30	770.71	39	15	22.75 - 37.75
PPMP-231-GP11	1179996.19	674959.13	773.79	774.08	40	20	18.75 - 38.75

Wells were installed using a 4.25-inch inside-diameter hollow-stem auger with 2-inch ID Schedule 40 PVC riser and screen. Elevations were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983.

bgs - Below ground surface.

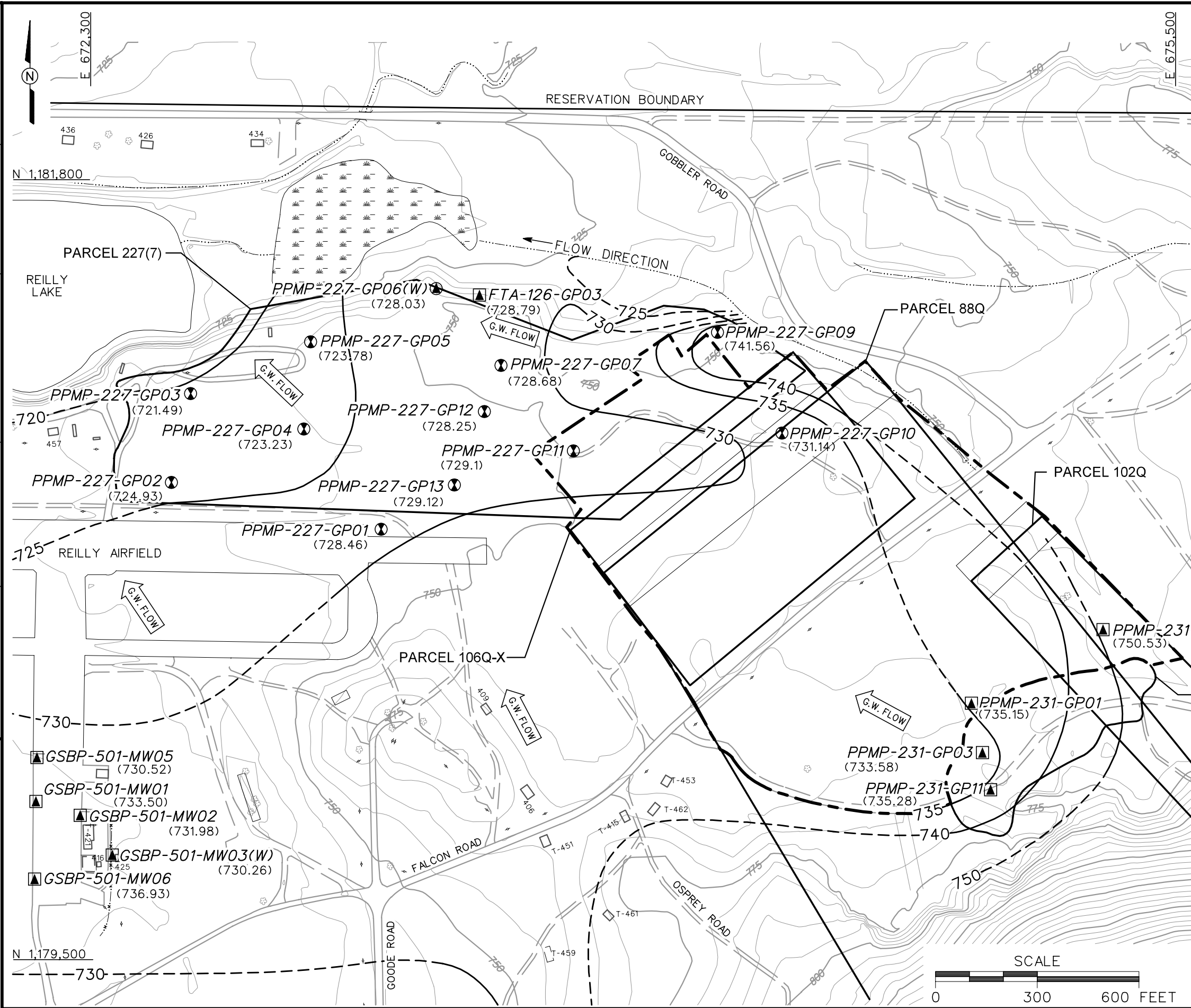
ft - Feet.

amsl - Above mean sea level.

NA - Not available.

TOC - Top of casing.

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DBILLING
DRAWN BY: D. BOMAR
DATE LAST REV.:
ENGR. CHK. BY: S. MORAN
DRAFT. CHK. BY:
INITIATOR: J. REMO
PROJ. NO.: 796887
DWG. NO.: ...796887\es.264



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- (721.29) GROUNDWATER ELEVATION (FT MSL) (MARCH 2000)
- G.W. FLOW GROUNDWATER FLOW DIRECTION
- TREES / TREELINE
- MARSH / WETLANDS
- AREA OF INVESTIGATION PARCELS 88Q AND 106Q-X
- FIRING LINES
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- FENCE
- UTILITY POLE
- GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- GROUNDWATER AND SUBSURFACE SOIL SAMPLE LOCATION

FIGURE 2-1
POTENTIOMETRIC SURFACE MAP
FILL AREA EAST OF
REILLY AIRFIELD, PARCEL 227(7)
AND FILL AREA AT RANGE 30,
PARCEL 231(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for Parcels 88Q, 102Q, and 106Q-X. This section incorporates the components of the DQO process described in *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to Parcels 88Q, 102Q, and 106Q-X is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 of this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data, presented in Table 3-1, related to the SI at Parcels 88Q, 102Q, and 106Q-X have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The users of the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

Table 3-1

Summary of Data Quality Objectives
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama

Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMC, IT Corporation Other contractors, and possible future land users	Parcels 227(7) and 231(7)	<u>Contaminant Source</u> Parcel 88Q, Parcel 102Q, and Parcel 106Q-X (explosives and lead)	<u>Surface soil</u>	SI to confirm the presence or absence of contamination in site media Definitive quality data for future decision- making	<u>Surface soil</u> All Samples TAL Metals and Explosives 10% VOCs, SVOCs, Chlorinated Pesticides, Chlorinated herbicides, Organophosphorous Pesticides	Definitive data in CESAS Level B data packages	39 direct-push surface soil samples + QC
		<u>Migration Pathways</u> Infiltration to subsurface soil, infiltration and leaching to groundwater, biotransfer to venison, dust emissions and volatilization to ambient air, groundwater discharge to surface water, and runoff and erosion to surface water and sediment <u>Potential Receptors</u> Residents (future), Recreational site user (current and future) Groundskeeper (future) Construction Worker (future) <u>PSSC</u> Metals, Explosives	<u>Subsurface Soil</u>		<u>Subsurface Soil</u> All Samples TAL Metals and Explosives 10% VOCs, SVOCs, Chlorinated Pesticides, Chlorinated herbicides, Organophosphorous Pesticides	Definitive data in CESAS Level B data packages	33 direct-push subsurface soil samples + QC
			<u>Groundwater</u>		<u>Groundwater</u> All Samples TAL Metals and Explosives 10% VOCs, SVOCs, Chlorinated Pesticides, Chlorinated herbicides, Organophosphorous Pesticides	Definitive data in CESAS Level B data packages	5 groundwater samples + QC
			<u>Surface Water</u>		<u>Surface Water</u> All Samples TAL Metals and Explosives 10% VOCs, SVOCs, Chlorinated Pesticides, Chlorinated herbicides, Organophosphorous Pesticides	Definitive data in CESAS Level B data packages	3 surface water samples + QC
			<u>Sediment</u>		<u>Sediment</u> All Samples TAL Metals and Explosives TOC and Grain Size 10% VOCs, SVOCs, Chlorinated Pesticides, Chlorinated herbicides, Organophosphorous Pesticides	Definitive data in CESAS Level B data packages	3 sediment samples + QC

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
PSSC - Potential site-specific chemical.
QC - Quality control.

SI - Site investigation.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TOC - Total organic carbon.
USACE - U.S. Army Corps of Engineers.
VOC - Volatile organic compound.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides a basis for identifying and evaluating potential risks and hazards to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates a consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for scenarios involving direct receptor contact with a contaminated source medium.

Primary contaminant releases were probably limited to training activities--more precisely, pieces of ammunition deposited on or within surface and subsurface soil and their subsequent breakdown. Also, burial areas from Parcels 227 and 231 may overlap areas of Parcels 88Q, 102Q, and 106Q-X; however, this is a preliminary assumption and will be determined after the SI. Potential contaminant transport pathways include infiltration and leaching to subsurface soil and groundwater, biotransfer to deer through browsing, dust emissions and volatilization to ambient air, groundwater discharge to surface water, surface water runoff, and erosion to surface water and sediment.

Data collected previously from parcels that overlap Parcels 88Q, 102Q, and 106Q-X will be incorporated into this SI and screened against the receptor-specific SSSLs.

Currently the ranges are not used and are not maintained. Trees and grass cover most of the study area. The ranges are not fenced; therefore, people may trespass at the sites for hunting. There is not sufficient surface water to support fish habitat for fish consumption. The only plausible receptor under the current land-use scenario is a recreational site user who may hunt. Other potential receptors considered, but not included under the current land-use scenario, are:

- **Groundskeeper.** The ranges are not currently maintained and will not be maintained in the future.
- **Construction Worker.** The site is unused, and no development or construction is occurring or scheduled.
- **Resident.** The site is not currently used for residential purposes.

Future land use in this area is shown as industrial and remediation reserve and passive recreation (FTMC, 1997). The sites may not be deemed safe for public access until remediation has been completed because of the potential for UXO (FTMC, 1997). Plausible future land-use receptor scenarios addressed in the CSEM include:

- **Resident.** Although the site is not planned for residential use, the residential scenario is considered in order to provide information for the project manager and regulators.
- **Recreational Site User.** Because the future site is planned for passive recreational use, and hunting is a viable option, the recreational site user is included. Fish ingestion will not be evaluated because the streams are too small to support fish for consumption.
- **Construction Worker.** The site may be developed for industrial purposes in the future.
- **Groundskeeper.** The portions of the ranges developed for industrial use will require maintenance; also, this receptor scenario represents the most highly exposed site worker for an industrial scenario.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

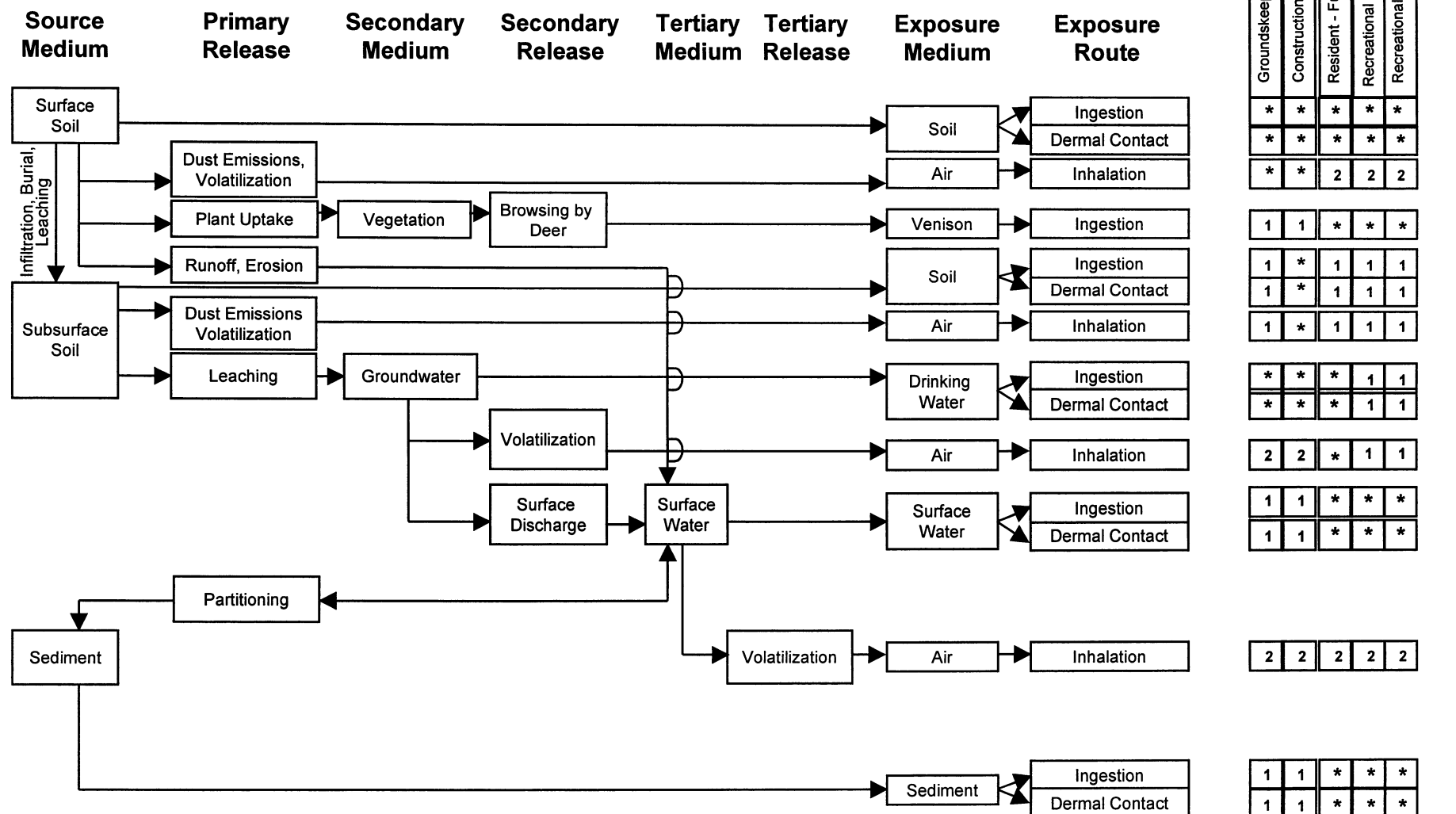
3.4 Decision-Making Process, Data Uses, and Needs

The decision-making process is a seven-step process that is presented in detail in Section 4.3 of the WP and will be followed during the SI at Parcels 88Q, 102Q, and 106Q-X. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination will be based on comparing detected site chemicals of potential concern to site-specific screening levels developed in the *Final Human Health and Ecological*

Figure 3-1
Generic Human Health Conceptual Site Exposure Model
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama



* = Complete exposure pathway evaluated in the streamlined risk assessment.

1 = Incomplete exposure pathway.

2 = Although theoretically complete, this pathway is judged to be insignificant and is not evaluated in the streamlined risk assessment.

Screening Values and PAH Background Summary Report (IT, 2000b). EPA definitive data with CESAS Level B data packages will be used to determine whether or not PSSCs are detected in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods) will be addressed in accordance with the procedures in the WP.

3.4.2 Data Types and Quality

Surface soil, subsurface soil, groundwater, surface water, and sediment will be sampled and analyzed to meet the objectives of the SI at Parcels 88Q, 102Q, and 106Q-X. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 Methods Update III, where available; comply with EPA definitive data requirements; and be reported using hard-copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

Parcels 88Q, 102Q, and 106Q-X, fall within the “Possible Ordnance Impact Area” shown on Plate 10 of the ASR (USACE, 1999a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings. The site-specific UXO safety work plan provides technical guidance for ordnance and explosives avoidance and construction activities for sample collection activities at Parcels 88Q, 102Q, and 106Q-X. The site-specific UXO safety work plan attachment has been written in conjunction with Appendix E of the SAP (IT, 2000a).

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. Subsurface metallic anomalies will not be disturbed but will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 2000a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 2000a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet bgs, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 2000a). The site manager will mark the proposed locations with stakes, coordinate with the local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program for Parcels 88Q, 102Q, and 106Q-X includes the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site. Additionally, samples will be collected from environmental media in locations that will assist in the assessment of potential ecological impacts resulting from activities at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from 39 locations in the area of investigation.

4.2.1.1 Sample Locations and Rationales

The surface soil sampling rationale are listed in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations and analytical parameters are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil using direct-push technology (DPT) as specified in Section 4.7.1.1 of the SAP (IT, 2000a). Soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from 33 borings installed in the area of investigation.

4.2.2.1 Sample Locations and Rationales

Subsurface soil samples will be collected from the proposed soil boring locations shown on Figure 4-1. The subsurface soil sampling rationale are listed in Table 4-1. Subsurface soil

Table 4-1

**Sampling Locations and Rationale
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

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Sample Location	Sample Media	Sample Location Rationale
HR-88Q-MW01	Surface soil, subsurface soil, and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be collected just south of Falcon Road in an area of heavy use and significant disturbance throughout the history of the site. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-MW02	Surface soil, subsurface soil, and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be collected in south-central portion of Parcel 88Q where historically a berm was identified on aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-MW03	Surface soil, subsurface soil, and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be collected in central portion of Parcel 88Q. This sample location was selected because it is a historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the southwestern corner of the area of investigation. This sample location was selected because review of aerial photographs showed historically the area to be heavily used with a significant amount of disturbance. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the southwestern portion of the area of investigation. This sample location was selected because it is a historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the southwestern portion of the area of investigation in a historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the southwestern portion of the area of investigation in a historically disturbed area identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected from the western portion of the area of investigation within the firing line for Parcel 88Q. This sample location was selected because it is in area with mounds and depressions identified during the site walk by IT personnel in October 2001. This sample will be collected from one of the mounds in this area. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the north-central portion of the area of investigation within the firing lining for Parcel 88Q. This sample location was selected because review of aerial photographs showed historically the area to be heavily used with a significant amount of disturbance. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP07	Surface soil	Surface soil sample to be collected in the north-central portion of the area of investigation within the firing lining for Parcel 88Q. The sample will be collected from within an area of three small mounds identified during the sitewalk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.

Table 4-1

**Sampling Locations and Rationale
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

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Sample Location	Sample Media	Sample Location Rationale
HR-88Q-GP08	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the eastern portion of the area of investigation within a historically disturbed area identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP09	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the eastern portion of the area of investigation. This sample location was selected because review of the aerial photographs revealed historically the area was significantly disturbed. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP10	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the east-central portion of the area of investigation down gradient of mounds discovered during the site walk by IT personnel. However, this sample location was selected because from the review of the aerial photographs revealed historically the area was significantly disturbed. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP11	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the eastern portion of the area of investigation from a mound discovered during the site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP12	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the eastern portion of the area of investigation within an area of some mounds, depressions and miscellaneous debris discovered during the site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP13	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the southeastern portion of the area of investigation from a historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP14	Surface Soil	Surface soil sample to be collected in the eastern portion of the area of investigation. The sample to be collected from a small mound identified during the site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP15	Surface Soil	Surface soil sample to be collected in the eastern portion of the area of investigation. The sample to be collected from a small mound identified during the site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP16	Surface soil and Subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the central portion of the area of investigation from a historical berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP17	Surface soil and Subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the central portion of the area of investigation within the firing line for Parcel 88Q from a historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.

Table 4-1

**Sampling Locations and Rationale
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

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Sample Location	Sample Media	Sample Location Rationale
HR-88Q-GP18	Surface Soil	Surface soil sample to be collected in the east-central portion of the area of investigation. The sample to be collected from within a small depression identified during a site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP19	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected along the western boundry of the area of investigation. This sample location was selected because review of the aerial photographs revealed historically the area was significantly disturbed. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP20	Surface soil	Surface soil sample to be collected in the west-central portion of the area of investigation within the firing lining for Parcel 88Q. The sample will be collected from within an a depression identified during a site walk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP21	Surface soil	Surface soil sample to be collected in the central portion of the area of investigation within the firing lining for Parcel 88Q. The sample will be collected from within a depression identified during a sitewalk by IT personnel. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP22	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 88Q from a disturbed area identified in the aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP23	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 88Q from a disturbed area identified in the aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP24	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 88Q from a disturbed area identified in the aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-GP25	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 88Q from a disturbed area identified in the aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-88Q-SW/SD01	Surface water and Sediment	The surface water and sediment samples will be collected up gradient of the area of investigation from a surface water drainage feature found along the north and eastern boundary of the area of investigation. Sample data will indicate if contaminant releases have occurred from runoff upstream of area of investigation from former activities in this area.
HR-88Q-SW/SD02	Surface water and Sediment	The surface water and sediment samples will be collected from a surface water drainage feature found along the north and eastern boundary of the area off investigation just within the eastern boundary of the firing line for Parcel 88Q. Sample data will indicate if contaminant releases have occurred from runoff upstream of area of investigation from former activities in this area.
HR-102Q-MW01	Surface soil, subsurface soil, and groundwater	Surface soil, subsurface soil, and groundwater samples to be collected downgradient of the firing line for the Former Rifle/Machine Gun Range, Parcel 102Q. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.

Table 4-1

**Sampling Locations and Rationale
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

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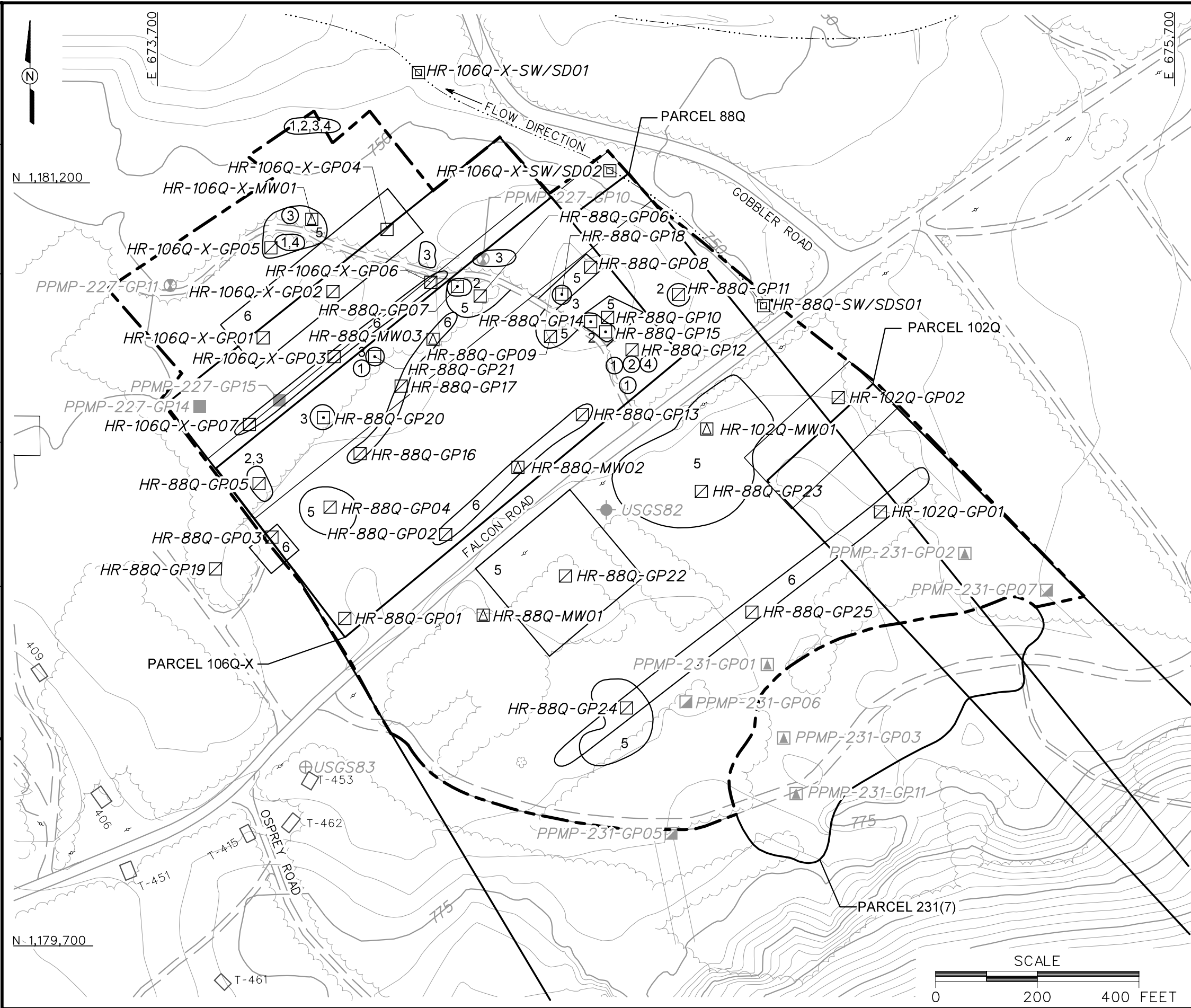
Sample Location	Sample Media	Sample Location Rationale
HR-102Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 102Q from a disturbed area identified in the aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-102Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected south of Falcon Road within Parcel 102Q from the firing line area identified in the Archive Search Report. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-MW01	Surface soil, subsurface soil, and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be collected in the northern portion of the area of investigation in an area identified in the ASR as the Hand Grenade Court (OA-15). The sample is located downgradient of several historic berm locations and in an area of heavy use. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples will be collected in the northwestern portion of the area of investigation and within Parcel 106Q-X. This sample location was selected because it is within an area where several historic berms were identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples will be collected in the northern portion of the area of investigation and within Parcel 106Q-X. This sample location was selected because it is within an area where several historic berms were identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the west-central portion of the area of investigation within Parcel 106Q-X. This sample location was selected because it is a historic a berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples will be collected in the northern portion of the area of investigation and within Parcel 106Q-X. This sample location was selected because it is within an area where several historic berms were identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected near the northern boundry of the area of investigation within a historically disturbed area identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the northern portion of the area of investigation within Parcel 106Q-X. This sample location was selected because it is a large historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.

Table 4-1

**Sampling Locations and Rationale
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

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Sample Location	Sample Media	Sample Location Rationale
HR-106QX-GP07	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be collected in the western portion of the area of investigation within Parcel 106Q-X. This sample location was selected because it is a large historic berm location identified during the review of aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location.
HR-106QX-SW/SD01	Surface Water and Sediment	The surface water and sediment samples will be collected down gradient of the area of investigation from a surface water drainage feature found along the north and eastern boundary of the area of investigation. Sample data will indicate if contaminant releases have occurred from runoff from former activities in this area. Sample data will also be used to assess potential impacts to aquatic biota in the waterway and other ecological receptors that may utilize the waterway for food and/or habitat purposes.



LEGEND

UNIMPROVED ROADS AND PARKING

PAVED ROADS AND PARKING

TOPOGRAPHIC CONTOURS
(CONTOUR INTERVAL - 5 FOOT)

TREES / TREELINE

AREA OF INVESTIGATION

FIRING LINES

SURFACE DRAINAGE / CREEK

UTILITY POLE

EXISTING USGS BEDROCK MONITORING WELL LOCATION

EXISTING USGS RESIDUUM MONITORING WELL LOCATION

EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

EXISTING SURFACE SOIL SAMPLE LOCATION

EXISTING GROUNDWATER AND SUBSURFACE SOIL SAMPLE LOCATION

EXISTING GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

PROPOSED SURFACE SOIL SAMPLE LOCATION

PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

PROPOSED GROUNDWATER, SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION

PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCATION

TRAINING AIDS/PHYSICAL FEATURES OBSERVED

① MISCELLANEOUS DEBRIS

② MOUNDS

③ DEPRESSIONS

④ METAL DEBRIS

⑤ FORMER DISTURBED AREA IDENTIFIED FROM AERIAL PHOTOGRAPHS

⑥ FORMER BERM LOCATIONS IDENTIFIED FROM AERIAL PHOTOGRAPHS

FIGURE 4-1

PROPOSED SAMPLE LOCATION MAP

RANGE 30, CONFIDENCE COURSE
(FIRING LINE), PARCEL 88Q

FORMER RIFLE/MACHINE GUN RANGE,

PARCEL 102Q

FORMER GRENADE RANGE/AREA,

PARCEL 106Q-X

U. S. ARMY CORPS OF ENGINEERS

MOBILE DISTRICT

FORT McCLELLAN

CALHOUN COUNTY, ALABAMA

Contract No. DACA21-96-D-0018

IT

IT CORPORATION

A Member of The IT Group

Table 4-2

Surface and Subsurface Soil Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama

(Page 1 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples		Analytical Suite
			Field Duplicates	MS/MSD	
HR-88Q-GP01	HR-88Q-GP01-SS-PQ0001-REG	0-1			TAL Metals Explosives
	HR-88Q-GP01-DS-PQ0002-REG	a			
HR-88Q-GP02	HR-88Q-GP02-SS-PQ0003-REG	0-1			TAL Metals Explosives
	HR-88Q-GP02-DS-PQ0004-REG	a	HR-88Q-GP02-DS-PQ0005-FD		
HR-88Q-GP03	HR-88Q-GP03-SS-PQ0006-REG	0-1			TAL Metals Explosives
	HR-88Q-GP03-DS-PQ0007-REG	a			
HR-88Q-GP04	HR-88Q-GP04-SS-PQ0008-REG	0-1			TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-88Q-GP04-DS-PQ0009-REG	a			
HR-88Q-GP05	HR-88Q-GP05-SS-PQ0010-REG	0-1			TAL Metals Explosives
	HR-88Q-GP05-DS-PQ0011-REG	a			
HR-88Q-GP06	HR-88Q-GP06-SS-PQ0012-REG	0-1			TAL Metals Explosives
	HR-88Q-GP06-DS-PQ0013-REG	a			
HR-88Q-GP07	HR-88Q-GP07-SS-PQ0014-REG	0-1			TAL Metals Explosives
HR-88Q-GP08	HR-88Q-GP08-SS-PQ0015-REG	0-1			TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-88Q-GP08-DS-PQ0016-REG	a			
HR-88Q-GP09	HR-88Q-GP09-SS-PQ0017-REG	0-1			TAL Metals Explosives
	HR-88Q-GP09-DS-PQ0018-REG	a			
HR-88Q-GP10	HR-88Q-GP10-SS-PQ0019-REG	0-1	HR-88Q-GP10-SS-PQ0020-FD		TAL Metals Explosives
	HR-88Q-GP10-DS-PQ0021-REG	a			
HR-88Q-GP11	HR-88Q-GP11-SS-PQ0022-REG	0-1			TAL Metals Explosives
	HR-88Q-GP11-DS-PQ0023-REG	a			

Table 4-2

**Surface and Subsurface Soil Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples		Analytical Suite
			Field Duplicates	MS/MSD	
HR-88Q-GP12	HR-88Q-GP12-SS-PQ0024-REG	0-1			TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-88Q-GP12-DS-PQ0025-REG	a			
HR-88Q-GP13	HR-88Q-GP13-SS-PQ0026-REG	0-1	HR-88Q-GP13-SS-PQ0027-FD		TAL Metals Explosives
	HR-88Q-GP13-DS-PQ0028-REG	a			
HR-88Q-GP14	HR-88Q-GP14-SS-PQ0029-REG	0-1			TAL Metals Explosives
HR-88Q-GP15	HR-88Q-GP15-SS-PQ0030-REG	0-1	HR-88Q-GP15-SS-PQ0031-FD		TAL Metals Explosives
HR-88Q-GP16	HR-88Q-GP16-SS-PQ0032-REG	0-1			TAL Metals Explosives
	HR-88Q-GP16-DS-PQ0033-REG	a			
HR-88Q-GP17	HR-88Q-GP17-SS-PQ0034-REG	0-1			TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-88Q-GP17-DS-PQ0035-REG	a		HR-88Q-GP17-DS-PQ0035-MS/MSD	
HR-88Q-GP18	HR-88Q-GP18-SS-PQ0036-REG	0-1			TAL Metals Explosives
HR-88Q-GP19	HR-88Q-GP19-SS-PQ0037-REG	0-1			TAL Metals Explosives
	HR-88Q-GP19-DS-PQ0038-REG	a			
HR-88Q-GP20	HR-88Q-GP20-SS-PQ0039-REG	0-1			TAL Metals Explosives
HR-88Q-GP21	HR-88Q-GP21-SS-PQ0040-REG	0-1			TAL Metals Explosives
HR-88Q-GP22	HR-88Q-GP22-SS-PQ0041-REG	0-1			TAL Metals Explosives
	HR-88Q-GP22-DS-PQ0042-REG	a			
HR-88Q-GP23	HR-88Q-GP23-SS-PQ0043-REG	0-1			TAL Metals Explosives
	HR-88Q-GP23-DS-PQ0044-REG	a	HR-88Q-GP23-DS-PQ0045-FD		

Table 4-2

**Surface and Subsurface Soil Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples		Analytical Suite
			Field Duplicates	MS/MSD	
HR-88Q-GP24	HR-88Q-GP24-SS-PQ0046-REG	0-1			TAL Metals Explosives
	HR-88Q-GP24-DS-PQ0047-REG	a			
HR-88Q-GP25	HR-88Q-GP25-SS-PQ0048-REG	0-1			TAL Metals Explosives
	HR-88Q-GP25-DS-PQ0049-REG	a			
HR-88Q-MW01	HR-88Q-MW01-SS-PQ0050-REG	0-1		HR-88Q-MW01-SS-PQ0050-MS/MSD	TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-88Q-MW01-DS-PQ0051-REG	a			
HR-88Q-MW02	HR-88Q-MW02-SS-PQ0052-REG	0-1		HR-88Q-MW01-SS-PQ0052-MS/MSD	TAL Metals Explosives
	HR-88Q-MW02-DS-PQ0053-REG	a			
HR-88Q-MW03	HR-88Q-MW03-SS-PQ0054-REG	0-1			TAL Metals Explosives
	HR-88Q-MW03-DS-PQ0055-REG	a	HR-88Q-MW03-DS-PQ0056-FD		
HR-102Q-GP01	HR-102Q-GP01-SS-QF0001-REG	0-1		HR-102Q-GP01-SS-QF0001-MS/MSD	TAL Metals Explosives
	HR-102Q-GP01-DS-QF0002-REG	a			
HR-102Q-GP02	HR-102Q-GP02-SS-QF0003-REG	0-1			TAL Metals Explosives
	HR-102Q-GP02-DS-QF0004-REG	a			
HR-102Q-MW01	HR-102Q-MW01-SS-QF0005-REG	0-1			TAL Metals Explosives
	HR-102Q-MW01-DS-QF0006-REG	a			
HR-106Q-GP01	HR-106Q-GP01-SS-PR0001-REG	0-1			TAL Metals Explosives
	HR-106Q-GP01-DS-PR0002-REG	a			
HR-106Q-GP02	HR-106Q-GP02-SS-PR0003-REG	0-1	HR-106Q-GP02-SS-PR0004-FD		TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides
	HR-106Q-GP02-DS-PQ0005-REG	a			
HR-106Q-GP03	HR-106Q-GP03-SS-PR0006-REG	0-1	HR-106Q-GP07-SS-PR0007-FD		TAL Metals Explosives
	HR-106Q-GP03-DS-PR0008-REG	a			

Table 4-2

**Surface and Subsurface Soil Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples		Analytical Suite
			Field Duplicates	MS/MSD	
HR-106Q-GP04	HR-106Q-GP04-SS-PR0009-REG	0-1			TAL Metals Explosives
	HR-106Q-GP04-DS-PR0010-REG	a			
HR-106Q-GP05	HR-106Q-GP05-SS-PR0011-REG	0-1			TAL Metals Explosives
	HR-106Q-GP05-DS-PR0012-REG	a			
HR-106Q-GP06	HR-106Q-GP05-SS-PR0013-REG	0-1			TAL Metals Explosives
	HR-106Q-GP05-DS-PR0014-REG	a			
HR-106Q-GP07	HR-106Q-GP05-SS-PR0015-REG	0-1			TAL Metals Explosives
	HR-106Q-GP05-DS-PR0016-REG	a			
HR-106Q-MW01	HR-106Q-MW01-SS-PR0011-REG	0-1			TAL Metals Explosives
	HR-106Q-MW01-DS-PR0012-REG	a			

^a Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

CL - Chlorinated.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

OP - Organophosphorous.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

VOC - Volatile organic compound.

sample designations and analytical parameters are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations and UXO and utility clearance results.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at depths greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the DPT sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 2000a).

Soil samples will be collected continuously for the first four feet. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface soil sample from each borehole will be selected for analysis. The samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analysis. Subsurface soil samples may be selected for analysis from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analysis. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or if additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Permanent Residuum Monitoring Wells

Five permanent residuum monitoring wells will be installed in the area of investigation. The permanent residuum monitoring well locations are shown on Figure 4-1. The rationale for the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock, or until adequate groundwater is encountered to install a well with a 10 to 20 foot screen. Monitoring wells will be installed using a hollow-stem auger drill rig mounted on a truck or all-terrain vehicle. The monitoring well casing will consist of new 2-inch

inside diameter (ID), Schedule 40, threaded, flush-joint, polyvinyl chloride pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap polyvinyl chloride (PVC) well screen, approximately 10 to 20 feet long. The well will be installed so the well screen intersects the water table.

The monitoring well casing will consist of new 2-inch ID, Schedule 40, threaded, flush-joint PVC pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap PVC well screen, approximately 10 to 20 feet long. The well will be installed so the well screen straddles the water table. At the discretion of the IT site manager, a sump (composed of new, 2-inch ID, schedule 40, threaded, flush-joint PVC) may be attached to the bottom of the well screen. After the casing and screen materials are lowered into the boring, a filter pack will be installed around the well screen. In wells installed to depths of 20 feet or less, the filter pack will be gravity fed. In wells installed to depths of 20 feet or more, the filter pack will be tremied into place from the bottom of the well to approximately 5-feet above the top of the well screen. The filter pack will consist of 20/40 silica sand. A fine sand (30/70 silica sand), approximately 5-feet thick may be placed above the filter pack. A bentonite, approximately 5-feet thick, will be placed above the filter pack (or fine sand seal, if used). The remaining annular space will be grouted with a bentonite-cement mixture, using approximately 7 to 8 gallons of water and approximately 5 pounds of bentonite per 94 pound bag of Type I or Type II Portland cement. The grout will be tremied into place from the top of the bentonite seal to ground surface.

Soil samples for lithology will be collected starting at 5-feet bgs and at 5-foot intervals thereafter to the total depth of the borehole, to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch long, 2-inch or larger diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000a). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions. After well development the monitoring well will be allowed to equilibrate 14 days prior to sample collection.

4.2.4 Groundwater Sampling

Groundwater samples will be collected from the five monitoring wells completed in the area of investigation as presented in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationale are listed in Table 4-1. The groundwater sample designations, and analytical parameters are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling each monitoring well, the static water level will be measured to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 2000a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP. Low-flow groundwater sampling methodology (IT, 200c) may be used as deemed necessary by the IT site manager.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 2000a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.5 Surface Water Sampling

Three surface water samples will be collected in the area of investigation. Surface water samples will be collected from the drainage ditches/creeks as shown on Figure 4-1.

4.2.5.1 Sample Locations and Rationale

The surface water sampling rationales are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and analytical parameters are listed in Table 4-4. The exact sampling locations will be determined in the field by the sample technician, based on drainage pathways and actual field observations.

4.2.5.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and

Table 4-3

**Groundwater Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	QA/QC Samples		Analytical Suite
		Field Duplicates	MS/MSD	
HR-88Q-MW01	HR-88Q-MW01-GW-PQ3001-REG		HR-88Q-MW01-GW-PQ3001-MS/MSD	TAL Metals and Explosives
HR-88Q-MW02	HR-88Q-MW02-GW-PQ3002-REG			TAL Metals and Explosives
HR-88Q-MW03	HR-88Q-MW03-GW-PQ3003-REG			TAL Metals and Explosives
HR-102Q-MW01	HR-102Q-MW01-GW-QF3001-REG			TAL Metals and Explosives
HR-106Q-MW04	HR-106Q-MW01-GW-PR3001-REG	HR-106Q-MW01-GW-PR3002-FD		TAL Metals, Explosives, VOCs SVOCs, OP/CL Pesticides, CL Herbicides

^a Groundwater samples will be collected from the approximate midpoint of the saturated screened interval of the monitoring well.

CL - Chlorinated.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

OP - Organophosphorous.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

VOC - Volatile organic compound.

Table 4-4

Surface Water and Sediment Sample Designations and Analytical Parameters
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	QA/QC Samples		Analytical Suite
			Field Duplicates	MS/MSD	
HR-88Q-SW/SD01	HR-88Q-SW/SD01-SW-PQ2001-REG HR-88Q-SW/SD01-SD-PQ1001-REG	Surface Water Sediment	HR-88Q-SW/SD01-SW-PQ2002-FD HR-88Q-SW/SD01-SD-PQ1002-FD		TAL Metals, Explosives, TOC & Grain Size (sediment only)
HR-88Q-SW/SD02	HR-88Q-SW/SD02-SW-PQ2003-REG HR-88Q-SW/SD02-SD-PQ1003-REG	Surface Water Sediment			TAL Metals, Explosives, TOC & Grain Size (sediment only) VOCs, SVOC, OP/CL Pesticides, CL Herbicides
HR-106Q-SW/SD02	HR-106Q-SW/SD01-SW-PR2001-REG HR-106Q-SW/SD01-SD-PR1001-REG	Surface Water Sediment		HR-106Q-SW/SD01-SW-PQ2004-MS/MSD HR-106Q-SW/SD01-SD-PQ1004-MS/MSD	TAL Metals, Explosives TOC & Grain Size (sediment only)

CL - Chlorinated.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

OP - Organophosphorous.

REG - Field sample.

SVOCs - Semivolatile organic compound.

TAL - Target analyte list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.6 Sediment Sampling

Three sediment samples will be collected from the area of investigation, at the same locations as the surface water samples described in Section 4.2.5.

4.2.6.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown on Figure 4-1. Sediment sampling rationale are presented in Table 4-1. The sediment sample designations and analytical parameters are listed in Table 4-4. The actual sediment sample points will be at the discretion of the sample technician ecological sampler, based on drainage pathways and actual field observations.

4.2.6.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 2000a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system or conventional civil survey techniques, as necessary, to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the North American Vertical Datum of 1988.

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.5 Analytical Program

Samples collected during the SI will be analyzed for a specific suite of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the area of investigation consist of the following analytical parameters:

- Target Analyte List Metals - EPA Method 6010B/7000
- Nitroaromatic and Nitramine Explosives - EPA Method 8330.

In addition, ten percent of the samples will be analyzed for the following analytical parameters:

- Target Compound List Volatile Organic Compounds – EPA Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds – EPA Method 8270C
- Chlorinated pesticides - EPA Method 8081A
- Chlorinated herbicides - EPA Method 8151A
- Organophosphorous pesticides - EPA Method 8141A.

Sediment samples will also be analyzed for the following parameters:

- Total Organic Carbon - EPA Method 9060
- Grain Size - American Society of Testing and Materials (ASTM) D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP).

Chemical data will be reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms and electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

Table 4-5

**Analytical Samples
Site Investigation
Parcels 88Q, 102Q, and 106Q-X
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ^a				EMAX
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis
Parcels 88Q, 102Q, and 106Q-X: 8 water matrix samples (5 groundwater samples and 3 surface water samples); 75 soil matrix samples (39 surface soil samples, 33 subsurface soil samples, and 3 sediment samples)											
All samples will be analyzed for the following parameters:											
TAL Metals	6010B/7000	water	normal	8	1	8	1	1	0	1	12
Nitroaromatic/Nitramine											
Explosives	8330	water	normal	8	1	8	1	1	0	1	12
TAL Metals	6010B/7000	soil	normal	75	1	75	8	4	0	2	92
Nitroaromatic/Nitramine											
Explosives	8330	soil	normal	75	1	75	8	4	0	2	92
Approximately 10 % of the samples will be analyzed for the following parameters:											
TCL VOCs	5035/8260B	water	normal	1	1	1	1	1	2	1	7
TCL SVOCs	8270C	water	normal	1	1	1	1	1	0	1	5
CL Pesticides	8081A	water	normal	1	1	1	1	1	0	1	5
OP Pesticides	8141A	water	normal	1	1	1	1	1	0	1	5
CL Herbicides	8151A	water	normal	1	1	1	1	1	0	1	5
TCL VOCs	5035/8260B	soil	normal	6	1	6	1	1	0	2	11
TCL SVOCs	8270C	soil	normal	6	1	6	1	1	0	2	11
CL Pesticides	8081A	soil	normal	6	1	6	1	1	0	2	11
OP Pesticides	8141A	soil	normal	6	1	6	1	1	0	2	11
CL Herbicides	8151A	soil	normal	6	1	6	1	1	0	2	11
Sediment samples only:											
TOC	9060	sediment	normal	3	1	3	0	0	0	0	3
Grain Size	ASTM 421/422	sediment	normal	3	1	3	0	0	0	0	3
Parcels 88Q, 102Q, and 106Q-X Subtotal:						207	27	20	2	21	296

^aField duplicate and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number. Trip blank samples will be collected for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used when field events last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to: EMAX Laboratories, Inc
1835 205th Street
Torrance, CA 90501
Attn: Elizabeth McIntyre
Tel: 424-618-8889
Fax: 424-618-0818

ASTM- American Society for Testing and Materials.
CL - Chlorinated.
MS/MSD - Matrix spike/matrix spike duplicate.
OP - Organophosphorous.
QA/QC - Quality assurance/quality control.
SVOC - Semivolatile organic compound

TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
VOC - Volatile organic compound.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 2000a). Completed analysis request/COC records will be secured and included with each shipment of coolers to:

EMAX Laboratories, Inc.
Attn: Elizabeth McIntyre
1835 205th Street
Torrance, California 90501
Telephone: (424) 618-8889.

4.7 Investigation-Derived Waste Management

Management and disposal of investigation-derived waste (IDW) will follow procedures and requirements described in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI is expected to include soil from DPT and hollow-stem-auger sampling, purge water from monitoring well development and sampling activities, decontamination fluids, spent well materials, and personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for these parcels. The SSHP attachment will be used in conjunction with the installation-wide safety and health plan.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT Project Manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the WP.

6.0 References

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid	BOD	biological oxygen demand	CWA	chemical warfare agent
2,4,5-T	2,4,5-trichlorophenoxyacetic acid	BRAC	Base Realignment and Closure	CWM	chemical warfare material; clear, wide mouth
2,4,5-TP	silvex	Braun	Braun Intertec Corporation	CX	dichloroformoxime
3D	3D International Environmental Group	BSC	background screening criterion	‘D’	duplicate; dilution
Abs	skin absorption	BTAG	Biological Technical Assistance Group	DAF	dilution-attenuation factor
Amsl	above mean sea level	BTEX	benzene, toluene, ethyl benzene, and xylenes	DANC	decontamination agent, non-corrosive
AC	hydrogen cyanide	BTOC	below top of casing	°C	degrees Celsius
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded	BTV	background threshold value	°F	degrees Fahrenheit
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded	BW	biological warfare	DCE	dichloroethene
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded	BZ	breathing zone; 3-quinuclidinyl benzilate	DDD	dichlorodiphenyldichloroethane
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded	C	ceiling limit value	DDE	dichlorodiphenyldichloroethene
ACGIH	American Conference of Governmental Industrial Hygienists	Ca	carcinogen	DDT	dichlorodiphenyltrichloroethane
ADEM	Alabama Department of Environmental Management	CAB	chemical warfare agent breakdown products	DEH	Directorate of Engineering and Housing
ADPH	Alabama Department of Public Health	CAMU	corrective action management unit	DEP	depositional soil
AEC	U.S. Army Environmental Center	CCAL	continuing calibration	DI	deionized
AEL	airborne exposure limit	CCB	continuing calibration blank	DID	data item description
AET	adverse effect threshold	CD	compact disc	DIMP	di-isopropylmethylphosphonate
AHA	ammunition holding area	CDTF	Chemical Defense Training Facility	DMBA	dimethylbenz(a)anthracene
AL	Alabama	CEHNC	U.S. Army Engineering and Support Center, Huntsville	DMMP	dimethylmethylphosphonate
ALAD	ä-aminolevulinic acid dehydratase	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	DOD	U.S. Department of Defense
amb.	Amber	CERFA	Community Environmental Response Facilitation Act	DOJ	U.S. Department of Justice
amsl	above mean sea level	CESAS	Corps of Engineers South Atlantic Savannah	DOT	U.S. Department of Transportation
ANAD	Anniston Army Depot	CG	carbonyl chloride (phosgene)	DP	direct-push
AOC	area of concern	CFC	chlorofluorocarbon	DPDO	Defense Property Disposal Office
APT	armor-piercing tracer	CFDP	Center for Domestic Preparedness	DPT	direct-push technology
ARAR	applicable or relevant and appropriate requirement	ch	inorganic clays of high plasticity	DQO	data quality objective
AREE	area requiring environmental evaluation	CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine	DRMO	Defense Reutilization and Marketing Office
ASP	Ammunition Supply Point	CK	cyanogen chloride	DRO	diesel range organics
ASR	Archives Search Report	cl	inorganic clays of low to medium plasticity	DS	deep (subsurface) soil
AST	aboveground storage tank	Cl.	chlorinated	DS2	Decontamination Solution Number 2
ASTM	American Society for Testing and Materials	CLP	Contract Laboratory Program	DWEL	drinking water equivalent level
ATSDR	Agency for Toxic Substances and Disease Registry	CN	chloroacetophenone	E&E	Ecology and Environment, Inc.
ATV	all-terrain vehicle	CNB	chloroacetophenone, benzene, and carbon tetrachloride	EBS	environmental baseline survey
AWARE	Associated Water and Air Resources Engineers, Inc.	CNS	chloroacetophenone, chloropicrin, and chloroform	EC ₅₀	effects concentration for 50 percent of a population
AWWSB	Anniston Water Works and Sewer Board	Co-60	cobalt-60	ECBC	Edgewood Chemical/Biological Command
‘B’	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)	CoA	Code of Alabama	EDQL	ecological data quality level
BCF	blank correction factor	COC	chain of custody; contaminant of concern	EE/CA	engineering evaluation and cost analysis
BCT	BRAC Cleanup Team	COE	Corps of Engineers	Elev.	elevation
BERA	baseline ecological risk assessment	Con	skin or eye contact	EM	electromagnetic
BEHP	bis(2-ethylhexyl)phthalate	COPC	contaminant of potential concern	EMI	Environmental Management Inc.
BFB	bromofluorobenzene	COPEC	contaminant of potential environmental concern	EM31	Geonics Limited EM31 Terrain Conductivity Meter
BFE	base flood elevation	CQCSM	Contract Quality Control System Manager	EM61	Geonics Limited EM61 High-Resolution Metal Detector
BG	Bacillus globigii	CRL	certified reporting limit	EOD	explosive ordnance disposal
bgs	below ground surface	CRZ	contamination reduction zone	EODT	explosive ordnance disposal team
BHC	betahexachlorocyclohexane	Cs-137	cesium-137	EPA	U.S. Environmental Protection Agency
bkg	background	CS	ortho-chlorobenzylidene-malononitrile	EPC	exposure point concentration
bls	below land surface	CSEM	conceptual site exposure model	EPIC	Environmental Photographic Interpretation Center
		ctr.	container	ER	equipment rinsate

List of Abbreviations and Acronyms *(Continued)*

ER-L	effects range-low
ER-M	effects range-medium
ESE	Environmental Science and Engineering, Inc.
ESN	Environmental Services Network, Inc.
ESV	ecological screening value
Exp.	explosives
E-W	east to west
EZ	exclusion zone
FAR	Federal Acquisition Regulations
FB	field blank
FD	field duplicate
FDA	U.S. Food and Drug Administration
FedEx	Federal Express, Inc.
FEMA	Federal Emergency Management Agency
FFE	field flame expedient
Fil	filtered
Flt	filtered
FMDC	Fort McClellan Development Commission
FML	flexible membrane liner
FMP 1300	Former Motor Pool 1300
FOMRA	Former Ordnance Motor Repair Area
Foster Wheeler	Foster Wheeler Environmental Corporation
Frtn	fraction
FS	field split; feasibility study
FSP	field sampling plan
ft	feet
ft/ft	feet per foot
FTA	Fire Training Area
FTMC	Fort McClellan
FTRRA	FTMC Reuse & Redevelopment Authority
g	gram
g/m ³	gram per cubic meter
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GCL	geosynthetic clay liner
GC/MS	gas chromatograph/mass spectrometer
GCR	geosynthetic clay liner
GFAA	graphite furnace atomic absorption
GIS	Geographic Information System
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar

GPS	global positioning system
GS	ground scar
GSA	General Services Administration; Geologic Survey of Alabama
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GST	ground stain
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
HEAST	Health Effects Assessment Summary Tables
Herb.	herbicides
HHRA	human health risk assessment
HI	hazard index
HNO ₃	nitric acid
HQ	hazard quotient
HQ _{screen}	screening-level hazard quotient
hr	hour
H&S	health and safety
HSA	hollow-stem auger
HTRW	hazardous, toxic, and radioactive waste
‘I’	out of control, data rejected due to low recovery
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICRP	International Commission on Radiological Protection
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDM	investigative-derived media
IDW	investigation-derived waste
IEUBK	Integrated Exposure Uptake Biokinetic
ILCR	incremental lifetime cancer risk
IMPA	isopropylmethyl phosphonic acid
IMR	Iron Mountain Road
in.	inch
Ing	ingestion
Inh	inhalation
IP	ionization potential
IPS	International Pipe Standard
IRDMIS	Installation Restoration Data Management Information System
IRIS	Integrated Risk Information Service
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
IT	IT Corporation

ITEMS	IT Environmental Management System TM
‘J’	estimated concentration
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
JPA	Joint Powers Authority
K	conductivity
K _{ow}	octonal-water partition coefficient
L	lewisite; liter
LC ₅₀	lethal concentration for 50 percent of population tested
LD ₅₀	lethal dose for 50 percent of population tested
l	liter
LBP	lead-based paint
LCS	laboratory control sample
LC ₅₀	lethal concentration for 50 percent population tested
LD ₅₀	lethal dose for 50 percent population tested
LEL	lower explosive limit
LOAEL	lowest-observed-advserse-effects-level
LT	less than the certified reporting limit
LUC	land-use control
LUCAP	land-use control assurance plan
LUCIP	land-use control implementation plan
max	maximum
MCL	maximum contaminant level
MCPA	4-chloro-2-methylphenoxyacetic acid
MDC	maximum detected concentration
MDCC	maximum detected constituent concentration
MDL	method detection limit
mg	milligrams
mg/kg	milligrams per kilogram
mg/kg/day	milligram per kilogram per day
mg/kgbw/day	milligrams per kilogram of body weight per day
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimeter
min	minimum
MINICAMS	miniature continuous air monitoring system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MM	mounded material
MMBtu/hr	million Btu per hour
MOGAS	motor vehicle gasoline

List of Abbreviations and Acronyms (Continued)

MPA	methyl phosphonic acid	oh	organic clays of medium to high plasticity	RCRA	Resource Conservation and Recovery Act
MPM	most probable munition	ol	organic silts and organic silty clays of low plasticity	RD	remedial design
MR	molasses residue	OP	organophosphorus	RDX	cyclonite
MS	matrix spike	ORP	oxidation-reduction potential	RfD	reference dose
mS/cm	millisiemens per centimeter	OSHA	Occupational Safety and Health Administration	ReB3	Rarden silty clay loams
MSD	matrix spike duplicate	OSWER	Office of Solid Waste and Emergency Response	REG	regular field sample
MTBE	methyl tertiary butyl ether	OWS	oil/water separator	REL	recommended exposure limit
msl	mean sea level	oz	ounce	RFA	request for analysis
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded	PA	preliminary assessment	RGO	remedial goal option
mV	millivolts	PAH	polynuclear aromatic hydrocarbon	RI	remedial investigation
MW	monitoring well	Parsons	Parsons Engineering Science, Inc.	RL	reporting limit
Na	sodium	Pb	lead	RPD	relative percent difference
NA	not applicable; not available	PCB	polychlorinated biphenyl	RRF	relative response factor
NAD	North American Datum	PCE	perchloroethene	RSD	relative standard deviation
NAD83	North American Datum of 1983	PCP	pentachlorophenol	RTECS	Registry of Toxic Effects of Chemical Substances
NAVD88	North American Vertical Datum of 1988	PDS	Personnel Decontamination Station	RTK	real-time kinematic
NAS	National Academy of Sciences	PEL	permissible exposure limit	SAD	South Atlantic Division
NCP	National Contingency Plan	PES	potential explosive site	SAE	Society of Automotive Engineers
ND	not detected	Pest.	pesticides	SAIC	Science Applications International Corporation
NE	no evidence; northeast	PETN	pentarey thritol tetranitrate	SAP	installation-wide sampling and analysis plan
ne	not evaluated	PFT	portable flamethrower	sc	clayey sands; sand-clay mixtures
NEW	net explosive weight	PG	professional geologist	Sch.	Schedule
NFA	No Further Action	PID	photoionization detector	SCM	site conceptual model
ng/L	nanograms per liter	PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes	SD	sediment
NGVD	National Geodetic Vertical Datum	POL	petroleum, oils, and lubricants	SDG	sample delivery group
Ni	nickel	POW	prisoner of war	SDZ	safe distance zone; surface danger zone
NIC	notice of intended change	PP	peristaltic pump	SEMS	Southern Environmental Management & Specialties, Inc.
NIOSH	National Institute for Occupational Safety and Health	ppb	parts per billion	SFSP	site-specific field sampling plan
NLM	National Library of Medicine	PPE	personal protective equipment	SGF	standard grade fuels
NPDES	National Pollutant Discharge Elimination System	ppm	parts per million	SHP	installation-wide safety and health plan
NPW	net present worth	PPMP	Print Plant Motor Pool	SI	site investigation
No.	number	ppt	parts per thousand	SL	standing liquid
NOAA	National Oceanic and Atmospheric Administration	PR	potential risk	SLERA	screening-level ecological risk assessment
NOAEL	no-observed-adverse-effects-level	PRG	preliminary remediation goal	sm	silty sands; sand-silt mixtures
NR	not requested; not recorded; no risk	PSSC	potential site-specific chemical	SM	Serratia marcescens
NRC	National Research Council	pt	peat or other highly organic silts	SOP	standard operating procedure
NRCC	National Research Council of Canada	PVC	polyvinyl chloride	sp	poorly graded sands; gravelly sands
ns	nanosecond	QA	quality assurance	SP	submersible pump
N-S	north to south	QA/QC	quality assurance/quality control	SQRT	screening quick reference tables
NS	not surveyed	QAP	installation-wide quality assurance plan	Sr-90	strontium-90
nT	nanotesla	QC	quality control	SRA	streamlined human health risk assessment
NTU	nephelometric turbidity unit	QST	QST Environmental, Inc.	Ss	stony rough land, sandstone series
nv	not validated	qty	quantity	SS	surface soil
O&G	oil and grease	Qual	qualifier	SSC	site-specific chemical
O&M	operation and maintenance	‘R’	rejected data; resample	SSHO	site safety and health officer
OB/OD	open burning/open detonation	R&A	relevant and appropriate	SSHP	site-specific safety and health plan
OD	outside diameter	RAO	removal action objective	SSL	soil screening level
OE	ordnance and explosives	RBC	risk-based concentration	SSSL	site-specific screening level

List of Abbreviations and Acronyms (Continued)

SSSSL	site-specific soil screening level
STB	supertropical bleach
STC	source term concentration
STEL	short-term exposure limit
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SUXOS	senior UXO supervisor
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA’s <i>Test Methods for Evaluating Solid Waste: Physical/Chemical Methods</i>
SWPP	storm water pollution prevention plan
SZ	support zone
TAL	target analyte list
TAT	turn around time
TB	trip blank
TBC	to be considered
TCA	trichloroethane
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzofurans
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compound
TLV	threshold limit value
TN	Tennessee
TNT	trinitrotoluene
TOC	top of casing; total organic carbon
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
TWA	time-weighted average
UCL	upper confidence limit
UCR	upper certified range
‘U’	not detected above reporting limit
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USACMLS	U.S. Army Chemical School
USAMPS	U.S. Army Military Police School
USATCES	U.S. Army Technical Center for Explosive Safety
USATEU	U.S. Army Technical Escort Unit

USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USC	United States Code
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
UTL	upper tolerance level
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Supervisor
UXOSO	UXO safety officer
V	vanadium
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validation qualifier
VX	nerve agent (O-ethyl-S-[diisopropylaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd³	cubic yards

N – The high-spike recovery is low
R – Data is rejected

SAIC – Data Qualifiers, Codes and Footnotes, 1995 Remedial Investigation

N/A – Not analyzed

ND – Not detected

Boolean Codes

LT – Less than the certified reporting limit

Flagging Codes

9 – Non-demonstrated/validated method performed for USAEC

B – Analyte found in the method blank or QC blank

C – Analysis was confirmed

D – Duplicate analysis

I – Interfaces in sample make quantitation and/or identification to be suspicious

J – Value is estimated

K – Reported results are affected by interfaces or high background

N – Tentatively identified compound (match greater than 70%)

Q – Sample interference obscured peak of interest

R – Non-target compound analyzed for but not detected (GC/MS methods)

S – Non-target compound analyzed for and detected (GC/MS methods)

T – Non-target compound analyzed for but not detected (non GC/MS methods)

U – Analysis in unconfirmed

Z – Non-target compound analyzed for and detected (non-GC/MS methods)

Qualifiers

J – The low-spike recovery is low

**Final
Site-Specific Safety and Health Plan
Range 30, Confidence Course (Firing Line), Parcel 88Q,
Former Rifle/Machine Gun Range, Parcel 102Q
Former Grenade Range/Area, Parcel 106Q-X
Tank Sub-Caliber/Carbine Transition/Machine
Gun Range (OA-08), Grenade Court (OA-15),
Unnamed Small Arms Range
Fort McClellan,
Calhoun County, Alabama**

**Prepared for:
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street, Mobile,
Alabama 36602**

**Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887**

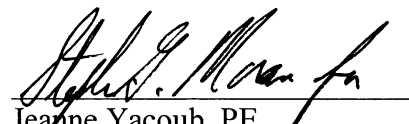
January 2002

The following Site-Specific Safety and Health Plan (SSHP) has been designed for the methods presently contemplated by IT Corporation (IT) for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated by IT. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified. Therefore, IT only makes representations or warranties as to the adequacy of the SSHP for currently anticipated activities and conditions.

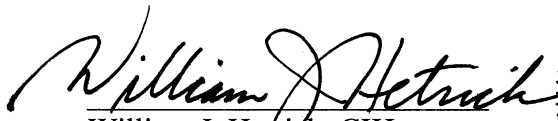
This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan and Installation-Wide Ordnance and Explosives Management Plan, Fort McClellan, Alabama.

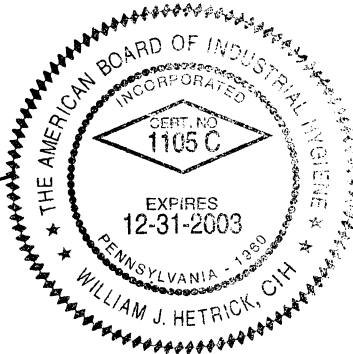
Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08), Grenade Court (OA-15), and Unnamed Small Arms Range, Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

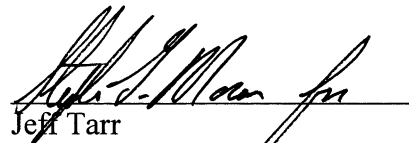

Jeanne Yacoub, PE
Project Manager

1/14/02
Date


William J. Hetrick, CIH
Health & Safety Manager



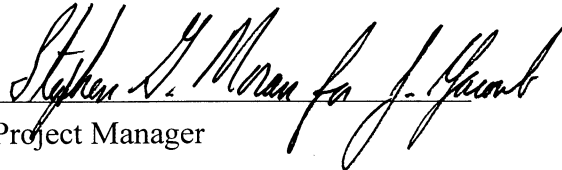
1/10/02
Date



Jeff Tarr
Site Coordinator

1/14/02
Date

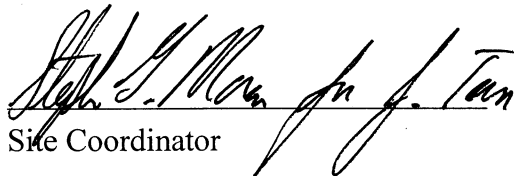
Acknowledgements

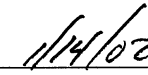
The approved version of this site-specific safety and health plan (SSHP) attachment for the Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08), Grenade Court (OA-15), and Unnamed Small Arms Range, Fort McClellan, Calhoun County, Alabama has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.


Project Manager


Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.


Site Coordinator


Date

Site-Specific Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in this site-specific safety and health plan attachment for work activities on the Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08), Grenade Court (OA-15), and Unnamed Small Arms Range, Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

DateThis image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Fort McClellan Gate Hours

Galloway Gate	Galloway Road. Open 6 am to 6 pm Monday through Friday
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.

Fort McClellan Project Emergency Contacts

Range Control Office (Main Post).....(256) 848-6772
Fire Department (off post)911
Ambulance (off post)911
Regional Medical Center(256) 235-5121
Military Police (SSG Busch) (256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton) (256) 848-5680, 848-4732
Anniston Police Department(256) 238-1800
Chemical Agent Emergencies.....(256) 895-1598
 (Mike Smith, CEHNC) cell phone (256) 759-3931
UXO Emergencies(256) 895-1598
 (Mike Smith, CEHNC) cell phone (256) 759-3931
UXO Non emergencies/Reporting Only (Ronald Levy)(256) 848-6853
Baltzell Gate Guard Shack..... (256) 848-5693, 848-3821
National Response Center & Terrorist Hotline.....(800) 424-8802
Poison Control Center.....(800) 462-0800
EPA Region IV(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management(256) 848-6853
Ellis Pope, U.S. Army Corps of Engineers.....(251) 690-3077
Jeanne Yacoub, IT Project Manager(770) 663-1429
Bill Hetrick, IT H&S Manager(865) 690-3211, ext. 2571; pager (888) 655-9529
Jeff Tarr, IT Site Manager(256) 848-3482, 3499
Mike Moore, Fort McClellan Safety Office(256) 848-5433
Dr. Jerry H. Berke, Health Resources Occupational Physician(800) 350-4511

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2.0 Site Characterization and Analysis	3
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4.0 Site Monitoring	8
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Attachment 1 – Evaluating OE/UXO/CWM in Support of HTRW Activities

List of Tables

<i>Number</i>	<i>Title</i>	<i>Follows Page</i>
2-1	Toxicological Properties of Chemicals	3
4-1	Action Levels	8
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5-1	Activity Hazard Analysis	10

List of Figures

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5-1	Hospital Emergency Route	10

List of Acronyms

See Attachment 1, List of Abbreviations and Acronyms, of the Site-Specific Field Sampling Plan Attachment contained in this binder.

1.0 Site Work Plan Summary

Project Objective. The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to conduct site investigation activities at Range 30, Confidence Course (Firing Line), Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; and Former Grenade Range/Area, Parcel 106Q-X.

The scope of work includes collection of the following:

- Surface soil samples
- Subsurface soil samples
- Groundwater samples (Installation of two permanent residuum monitoring wells)
- Sediment samples.

Attachment 1, Evaluating ordnance explosive (OE)/unexploded ordnance (UXO)/chemical warfare material (CWM) Hazards in Support of hazardous, toxic, and radioactive waste (HTRW) Activities, confirm that the historical records available for the parcels have been reviewed and that UXO support is required for all site activities. Figures 1-1 and 1-2 in the Site-Specific Field Sampling Plan (SFSP) show the site map and the location of parcels. Figure 1-3 of the SFSP presents the same information by range identity, as opposed to parcel location. Table 1-1 in the SFSP provides references to each parcel and historical information on description and use. Additionally, based on all available information, it is anticipated that the potential for chemical warfare agents is low; also, no real time air monitoring for chemical warfare materials will be required.

UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance. The site-specific UXO safety plan will be used to support sample collection activities for this investigation and will provide specific instructions if incidental ordnance, explosives, and UXO are encountered and require avoidance.

At completion of the field activities and sample analysis, draft and final reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of potential site-

specific chemicals (PSSC) at this site, and to recommend further actions, if appropriate. Range sampling reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV, and the Alabama Department of Environmental Management (ADEM) guidelines.

Personnel Requirements. Up to 15 employees are anticipated for this scope of work.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific safety and health plan (SSHHP). This SSHHP must be used in conjunction with the Installation Wide SHP, FTMC, Alabama and the Site Specific UXO Safety Work Plan which provides technical guidance for Ordnance and Explosives avoidance.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE). Site control with the use of specific work zones (support zone, contamination reduction zone, and exclusion zone) is addressed in Chapter 7.0 of Appendix A of the IT, August 2000a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*.

Detailed descriptions of each of the ranges to be investigated can be found in Section 1.0 (Project Description) the site specific field sampling plan (SFSP) and should be reviewed to supplement this SSHP. Potential contaminant sources at on the ranges identified in this plan are primarily unknown, but may include nitroexplosives (nitroaromatic and nitroamine) and metals. Lead in soil will be the most likely metal encountered since live fire was conducted at the ranges. Additional metals associated with the live fire of ammunition include: arsenic, antimony, and barium. Ten percent of the samples will be collected and analyzed for selected volatile organic compounds (VOC) , semivolatile organic compounds (SVOC), chlorinated pesticides, herbicides, and organophosphate pesticides. Sediment samples will be analyzed for total organic carbon. Engineering controls (dust suppression) will be required where site activities generate visible dust emissions from vehicle and equipment operations performed off established roadways and within the surface danger zone or range fan firing direction and impact areas. The site and proposed sample location maps in the SFSP illustrate impact and range fan areas where the highest potential for lead contamination is anticipated.

Procedures contained in the Site Specific UXO Safety Plan shall be followed for all site activities associated with this investigation.

Table 2-1 contains the toxicological properties of chemicals anticipated or to be used at the ranges identified in this plan.

Table 2-1

Toxicological Properties of Chemicals
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Arsenic [7440-38-2]	NONE	NONE	Inh Ing Con	Cough, diarrhea, shortness of breath, vomiting, grey skin. Redness	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.01 mg/m ³ 0.01 mg/m ³	.002 mg/m ³ (Ca)	PEL TLV REL	5 mg/m ³
Antimony [7440-36-0]	NONE	NONE	Inh Ing Con	Coughing, abdominal pain, burning sensation, vomiting, diarrhea,	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow : Immediate medical attention	0.5 mg/m ³ 0.5 mg/m ³ 0.5 mg/m ³		PEL TLV REL	50 mg/m ³
Barium [7440-39-3]	NONE	NONE	Inh Ing Con	Cough, sore throat Redness	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.5 mg/m ³ 0.5 mg/m ³ 0.5 mg/m ³		PEL TLV REL	NA

Table 2-1

Toxicological Properties of Chemicals
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention	NONE		PEL TLV REL	

Table 2-1

Toxicological Properties of Chemicals
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Gasoline [8006-61-9]		0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	- 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	- 500 ppm	PEL TLV REL	1400 ppm (10% LEL)
Lead {7439-92-1}	N/A	N/A	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.05 mg/m ³ 0.05 mg/m ³ 0.1mg/m ³		PEL TLV REL	100 mg/m ³
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	2,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention	NONE		PEL TLV REL	
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	- 4 ppm 4 ppm	PEL TLV REL	25ppm

Table 2-1

Toxicological Properties of Chemicals
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Nitroglycerin [55-63-0]	NA	NA	Inh Ing Con	Abdominal ramps, blue lips and fingernails, dizziness, headache, labored breathing	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	- 0.46 mg/m ³ skin -	.2 mg/m ³ skin - 0.1 mg/m ³ skin	PEL TLV REL	75 mg/m ³
Portland cement [65997-15-1]	NA	NA	Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	5 mg/m ³ respirable dust 15 mg/m ³ total dust 10 mg/m ³ 10 mg ³ / total dust 5 mg/m ³ respirable dust	- - -	PEL TLV REL	5000 mg/m ³
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	2 mg/m ³ - -	- C 2 mg/m ³ C 2 mg/m ³	PEL TLV REL	10 mg/m ³

IP = Ionization potential (electron volts).

^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.^ePEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value□TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

Table 2-1

Toxicological Properties of Chemicals
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
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¹IDLH (NIOSH) Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.

Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.

Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.

Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.

Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.

National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.

Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.

Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.

Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

2.2 General Site Information

Location of Site. FTMC is located in the foothills of the Appalachian Mountains of northeastern Alabama near the cities of Anniston and Weaver in Calhoun County. FTMC is approximately 60 miles northeast of Birmingham, 75 miles northwest of Auburn and 95 miles west of Atlanta, Georgia. FTMC consists of three main areas of government-owned and leased properties: Main Post, Pelham Range and Choccolocco Corridor (lease terminated in May 1998).

The ranges are not fenced and it is possible that hunters may trespass at the sites. The study area includes the range firing line(s), target line(s) and impact zone(s). Study areas are defined in this work plan and are based on the historical range use and topography. The safety fan is defined as the down range area where personnel were not allowed when training was in progress. Safety fans limits were originally defined by the Army and are based on the ballistics of the ordnance used at the range and the range orientation.

Possible pathways for hazardous substances in the area are soils, sediments, surface water, and groundwater.

Duration of Planned Employee Activity. Employee activity duration is anticipated to be less than one month.

Site Description

Parcels 88Q, 102Q, and 106Q-X are located in the northern part of the Main Post of FTMC, east of Reilly Airfield. Parcels 88Q, 102Q, and 106Q-X are the primary ranges of concern for the area of investigation. Although the range fans for Parcels 88Q and 106Q-X cover an area much greater in size, this SI will be limited to approximately 34 acres, which incorporate all of Parcel 106Q-X, approximately one-third of Parcel 102Q, and that portion of Parcel 88Q located northwest of the Fill Area at Range 30, Parcel 231(7) and an adjacent dirt road.

The Small Arms Range is oriented northwest-southeast, overlapping Parcels 88Q and 106Q-X. Based on the position of Reilly Airfield to the west and the location of the firing line of Parcel 88Q, the most likely direction of fire at the small arms range would have been to the southeast across Falcon Road. However, based on the orientation of the range, the impact area appears to be the base of the hill located south of Falcon Road.

OA-08 overlaps Parcels 88Q and 106Q-X and extends on both the north and south sides of Falcon Road. During the 1950s, sub-caliber devices for use in tank main guns, including 37-millimeter ammunition with black powder charges, were fired from 14 firing points. By 1958, the range had changed into a Carbine Transition Range (R-32). Before 1967, the range was used for machine gun field firing. The maps in the site sampling plan indicate that the range layout was changed often resulting in various orientations.

The Grenade Court (OA-15) is located north of Parcel 88Q and partially overlaps Parcel 106Q-X. The Grenade Court was abandoned by 1958. The 1950 range map shows the range as a Hand Grenade Court with 12 bays.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are soils, sediments, surface water, and groundwater.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Initial UXO avoidance sweep and equipment staging	Level D
Utility clearance	Level D
Surface water, sediment and surface soil sampling (Including x-ray fluorescence [XRF])	Level D
Subsurface soil and groundwater sampling	Modified Level D*
Monitoring well installation and downhole UXO avoidance	Modified Level D*
Surveying	Level D

* Initial level will be raised to Level C or higher if air monitoring results in the breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hardhat
- Wear hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hardhat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Modified Level D PPE, the operator of high-pressure water jetting equipment (pressure washers), shall wear metatarsal guards for protection of the legs and feet and a face shield for protection from splashes (refer to IT H&S Procedure HS 303).

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hardhat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment (pressure washers), shall wear metatarsal guards for protection of the legs and feet and a face shield for protection from splashes (refer to IT H&S Procedure HS 303).

4.0 Site Monitoring

The environmental contaminants of concern resulting from former activities on the ranges identified in this plan are primarily unknown but based on land use history probably include nitro explosives, white phosphorous and lead. Table 4-1 contains action levels for site monitoring.

Chemical. The site safety and health officer or task geologist shall perform air monitoring during the performance of site activities and ground intrusive operations. A calibrated photo ionization detector (i.e., Hnu DL-101 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading the protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the borehole, work areas and BZs to determine if any combustible/flammable gases may be present that would necessitate evacuation of the work area. A Miniram PDM-3 or equivalent aerosol monitor shall be used to monitor airborne dust since lead is a potential concern. Table 4-2 contains the required air monitoring frequency and location for site monitoring at the three parcels under investigation.

Radiological. Radiation hazards are not anticipated from previous site activities. However, the field screening for lead contamination within range fans using the NITON XRF instrument requires general radiation awareness training. The XRF contains cadmium₁₀₉, americium₂₄₁, and iron₅₅ sealed radioactive sources. Operators of the XRF shall be trained in the safe use of the instrument and follow all required manufacturers instructions. Leak detection testing within the last six months shall be performed on the XRF and certificates of analysis included in the shipping container. Required licensing documentation and storage requirements shall be enforced. Exposure to radiation is related to three factors: time, distance and shielding. Human exposure to radiation is typically measured in rems, or in one-thousandths of a rem, called millirems (mR). The allowable limit in the US for occupational exposure is 5,000 mR/year for a whole-body and 50,000 mR for shallow penetration of extremities. Exposure from a properly used NITON will be less than 50 mR per year, even if the instrument is used 2,000 hours per year.

Unexploded Ordnance. UXO support for sampling activities are specified in the site-specific UXO safety plan developed for the ranges identified in this plan. The UXO specialists will perform UXO avoidance sweeps prior to moving the heavy equipment onto the site. During this operation, UXO on the surface will be detected and marked for avoidance during field operations. Additionally, downhole magnetometer surveys will be performed to detect metal

Table 4-1

Action Levels

Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08), and Grenade Court (OA-15), and Unnamed Small Arms Range Fort McClellan, Calhoun County, Alabama

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When in Level C PPE

Analyte	Action Level ^a	Required Action ^b
VOCs (volatile organic compound)	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B; Notify CIH
Dust	> 5.0 mg/m ³ above background in BZ	Stop operations, Notify CIH.
LEL (lower explosive limit)	≤ 10 % LEL ≥ 10 % LEL	Normal operations Stop work, identify source

When in Level D Modified/D PPE

Analyte	Action Level ^a	Required Action ^b
VOCs	≥ 1 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE; Notify CIH
Dust	≥ 0.5 mg/m ³ above background in BZ	Stop work, Initiate dust control, upgrade to Level C PPE if dust control is not effective; Notify CIH
LEL (lower explosive limit)	≤ 10 % LEL ≥ 10 % LEL	Normal operations Stop work, identify source. Monitor for VOC's

Table 4-1

Action Levels
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former
Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-
Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama

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When in Support Zone

Analyte	Action Level ^a	Required Action ^b
VOCs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.
Dust	> 0.5 mg/m ³ above background in BZ	Stop work, Initiate dust control

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Range 30, Confidence Course (Firing Line), Parcel 88Q, Former
Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-
Caliber/Carbine Transition/Machine Gun Range (OA-08),
and Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment and UXO avoidance sweeps	OV Monitor Miniram	Initially for area Periodically	(BZ) of employees
Sampling (surface water, surface soil, sediment, and XRF analysis)	OV Monitor Miniram	Periodically Periodically	BZ of employees BZ of employees
Monitoring well installation and subsurface soil sampling	OV Monitor Miniram LEL/ O ₂	Periodically Periodically Periodically	BZ of employees BZ of employees Bore hole
XRF Sampling	Miniram	Periodically	BZ of employees

OV = Organic vapor as determined by a PID or FID.

Miniram = Aerosol (dust) monitor (direct reading instrument).

LEL/O₂ = Lower Explosive Limit/Oxygen as determined by a Combustible Gas Meter.

BZ = Breathing Zone of employee(s).

objects in the path of sampling equipment or boring apparatus. The sampling/boring location will be moved to avoid subsurface metal objects. It will be standard practice to conduct UXO avoidance for all intrusive activities.

If UXO is encountered, personnel will contact the site manager and UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Initial UXO avoidance sweep and equipment staging.
- Installation of monitoring wells.
- Subsurface soil, groundwater, surface water and sediment sampling.
- Surveying.
- Moving and shipping collected samples.
- Disposal of investigative derived waste (forklift operations).
- High-pressure water jetting operations.

All injuries and illnesses must be immediately reported to the site manager and the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Alabama Regional Medical Center. Directions to the hospital from the various ranges identified in this plan are provided on Figure 5-1.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
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Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Determine best access route before transporting equipment. Practice good housekeeping; keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards. Look before you step; ensure safe and secure footing.
	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	<ul style="list-style-type: none"> Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	<ul style="list-style-type: none"> Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	<ul style="list-style-type: none"> Keep hands, fingers, and feet clear of moving/suspended materials and equipment. Beware of contact points. Stay alert at all times!
	Cuts/bruises	<ul style="list-style-type: none"> Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	<ul style="list-style-type: none"> Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	<ul style="list-style-type: none"> Wear light colored clothing (can see ticks better). Mow vegetated and small brush areas. Wear insect repellent. Wear long sleeves and long pants. Visually check oneself promptly and frequently after exiting the work area.
	Fire	<ul style="list-style-type: none"> Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	<ul style="list-style-type: none"> Label all containers as to contents and dispose of properly. Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	<ul style="list-style-type: none"> Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	<ul style="list-style-type: none"> Adequate lighting will be provided to ensure a safe working environment.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

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Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Cold stress	<ul style="list-style-type: none"> Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. Remove wet clothing promptly. Take breaks in warm areas. Reduce work periods as necessary. Layer work clothing.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> Avoid plant areas if possible. Wear long sleeves and long pants. Promptly wash clothing that has contacted poisonous plants. Wash affected areas immediately with soap and water.
	Heat rash	<ul style="list-style-type: none"> Keep the skin clean and dry. Change perspiration-soaked clothing, as necessary. Bathe at end of work shift or day. Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> Drink plenty of cool fluids even when not thirsty. Provide cool fluid for work crews. Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none"> Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). Set up work/rest periods. Use the "buddy system." Allow workers time to acclimate. Have ice packs available for use. Take frequent breaks.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
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Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Heat stroke	<ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices.
	Contact with moving equipment/vehicles	<ul style="list-style-type: none">• Work area will be barricaded/demarcated.• Equipment will be laid out in an area free of traffic flow.• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.• Barriers shall be used to protect workers from vehicular traffic.• Barriers shall be used to guard excavations adjacent to streets or roadways.• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.• Heavy equipment shall have backup alarms.
	Forklift operations	<ul style="list-style-type: none">• Use qualified and trained forklift operators.• The operator shall not exceed the load capacity rating for the forklift.• The load capacity shall be clearly visible on the forklift.• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	<ul style="list-style-type: none">• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.• Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit interrupter (GFCI) device.• Electrical tools shall be inspected daily prior to use.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

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Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Extension cords	<ul style="list-style-type: none"> Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.). Cords shall be designed for hard duty. Cords shall be inspected daily.
	Lightning strikes	<ul style="list-style-type: none"> Whenever possible, get away from elevated locations (i.e. roofs, ladders, equipment), halt activities and take cover. Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). Seek shelter in a building if possible. Stay away from windows. If available, crouch under a group of trees instead of one. Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	<ul style="list-style-type: none"> Listen to radio or TV announcements for pending weather information. Cease field activities during thunderstorm or tornado warnings. Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. Provide adequate lighting in all work areas. Whenever possible, avoid routing cords and hoses across walking pathways. Flag or cover inconspicuous holes to protect against falls. Work areas will be kept clean and orderly. Garbage and trash will be disposed of daily in approved refuse containers. Tools and accessories will be properly maintained and stored. Work areas and floors will be kept free of dirt, grease, and slippery materials.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
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Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	<ul style="list-style-type: none"> Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. If working adjacent to roadways, have workers wear fluorescent orange vests. Use warning signs or lights to alert oncoming traffic. Assign flag person(s) if necessary to direct local traffic. Set up temporary parking locations outside the immediate work area. Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. Pedestrians have the right-of-way. Wear seat belts when vehicles are in motion.
	Wildlife hazards	<ul style="list-style-type: none"> Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	<ul style="list-style-type: none"> Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	<ul style="list-style-type: none"> Wear light colored clothing (can see ticks better). Mow vegetated and small brush areas. Wear insect repellent. Wear long sleeves and long pants. Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> Avoid plant areas if possible. Wear long sleeves and long pants. Promptly wash clothing that has contacted poisonous plants. Wash affected areas immediately with soap and water.
	UXO	<ul style="list-style-type: none"> UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. If UXO is encountered, cease all activities, mark the location, and notify the site manager.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 14)

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none">• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.• Avoid skin contact with water.• Handle samples with care.• Only essential personnel will be in the work area.• Real-time air monitoring will take place before and during sampling activities.• All personnel will follow good hygiene practices.• Proper decontamination procedures will be followed.• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none">• Use care when handling glassware.• Wear adequate hand protection.
	Hazard communication	<ul style="list-style-type: none">• MSDSs shall be obtained for chemicals brought on site.• Label all containers as to contents.
	Strains/sprains	<ul style="list-style-type: none">• Use the proper tool for the job being performed.• Get assistance if needed.• Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	<ul style="list-style-type: none">• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	<ul style="list-style-type: none">• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	<ul style="list-style-type: none">• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 14)

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF)	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> Stop immediately at any sign of obstruction. Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. Only essential personnel will be in the work area. Real-time air monitoring will take place before and during sampling activities. All personnel will follow good hygiene practices. Proper decontamination procedures will be followed. All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> Use care when handling glassware. Wear adequate hand protection.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. Whenever possible, avoid routing cords and hoses across walking pathways. Flag or cover inconspicuous holes to protect against falls.
	Bees, spiders, and snakes	<ul style="list-style-type: none"> Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> Avoid plant areas if possible. Wear long sleeves and long pants. Promptly wash clothing that has contacted poisonous plants. Wash affected areas immediately with soap and water.
	Cold stress	<ul style="list-style-type: none"> Workers should wear insulated clothing when temperatures drop below 40°F. Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. Remove wet clothing promptly. Take breaks in warm areas. Reduce work periods as necessary. Layer work clothing.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q,
Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08)
Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 14)

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF) (continued)	Access/egress hazards	<ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned.
	Heat rash	<ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none">• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).• Set up work/rest periods.• Use the buddy system.• Allow workers time to acclimate.• Have ice packs available for use.• Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 14)

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF) (continued)	Lightning strikes	<ul style="list-style-type: none"> Whenever possible, get away from elevated locations (i.e. roofs, ladders, equipment), halt activities and take cover. Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). Seek shelter in a building if possible. Stay away from windows. If available, crouch under a group of trees instead of one single tree. If in a group, keep 6 feet of distance between people.
	UXO	<ul style="list-style-type: none"> UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist.
	Accidental exposure to chemical agents	<ul style="list-style-type: none"> Low-level real-time environmental monitoring will be performed by Quanterra Battelle Quicksilver Center. Modified Level D personal protective equipment (PPE) will be required. During the first 15 feet depth of each monitoring well installation activity, downhole geophysics will be performed. Engineering controls will be used as appropriate. Personnel will be equipped with an emergency egress air supply pack.
Moving and Shipping Collected Samples	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Pinch points	<ul style="list-style-type: none"> Keep hands, fingers, and feet clear of moving/suspended materials and equipment. Beware of contact points. Stay alert at all times!
	Cut hazards	<ul style="list-style-type: none"> Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	<ul style="list-style-type: none"> Label all containers as to contents and associated hazards.
	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 10 of 14)

Activity	Potential Hazards	Recommended Controls
Material Storage	Flammable and combustible liquids	<ul style="list-style-type: none"> • Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.
Disposal of Investigation-Derived Waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> • Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.
High-Pressure Water Jetting Operations	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 11 of 14)

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Fueling	<ul style="list-style-type: none"> Only approved safety cans shall be used to store fuel. Do not refuel equipment while it is operating. Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	<ul style="list-style-type: none"> Equipment shall be inspected before being placed into service and at the beginning of each shift. Preventive maintenance procedures recommended by the manufacturer shall be followed. A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	<ul style="list-style-type: none"> Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). One standby person shall be available within the vicinity of the pump during jetting operation. The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	<ul style="list-style-type: none"> Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	<ul style="list-style-type: none"> No machinery or equipment is permitted to run unattended. Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	<ul style="list-style-type: none"> Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	<ul style="list-style-type: none"> All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	<ul style="list-style-type: none"> Keep feet and hands clear of moving/suspended materials and equipment. Stay alert and clear of materials suspended .
	Falling objects	<ul style="list-style-type: none"> Hard hats are required by site personnel. Stay alert and clear of material suspended overhead.
	Flying debris	<ul style="list-style-type: none"> Impact-resistant safety glasses with side shields are required.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 12 of 14)

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Contact with potentially contaminated materials	<ul style="list-style-type: none"> All site personnel will wear the appropriate PPE.
Drilling and Installation of Monitoring Wells	Overhead hazards	<ul style="list-style-type: none"> Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines.
	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. Equipment will be inspected before being put to use and at the beginning of each shift. Faulty/unsafe equipment will be tagged and if possible locked out. Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. All mobile equipment and areas in which they are operated shall be adequately illuminated. Aboveground and belowground utilities will be located prior to staging equipment. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines will have the wheels chocked. Inspect brakes and tire pressure on drill rig before staging for work.
	Inexperienced operator	<ul style="list-style-type: none"> Machinery and mechanized equipment shall be operated only by designated personnel. Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.
	Jacks/outriggers	<ul style="list-style-type: none"> Ensure proper footing and cribbing.
	Falling objects	<ul style="list-style-type: none"> Remove unsecured tools and materials before raising or lowering the derrick. Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> Keep feet and hands clear of moving/suspended materials and equipment. Stay alert at all times!

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 13 of 14)

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	Fire	<ul style="list-style-type: none">• Mechanized equipment shall be shut down prior to and during fueling operations.• Have fire extinguishers inspected and readily available.
	Fall hazards	<ul style="list-style-type: none">• Personnel are not allowed to work off of machinery or use them as ladders.• Use fall protection when working above 6 feet.
	Contact with rotating or reciprocating machine parts	<ul style="list-style-type: none">• Use machine guards; use long-handled shovels to remove auger cuttings.• Safe lockout procedures for maintenance work.
	Heavy lifting	<ul style="list-style-type: none">• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none">• Practice good housekeeping, keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	<ul style="list-style-type: none">• Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.• Stop immediately at any sign of obstruction.• Do not breathe air surrounding the boring unless necessary.• Upgrade to respirator if necessary.• Avoid skin contact with soil cuttings. Wear gloves.• Stay clear of moving parts of drill rig.

Table 5-1

Activity Hazard Analysis

**Range 30, Confidence Course (Firing Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel 102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08) Grenade Court (OA-15), and Unnamed Small Arms Range
Fort McClellan, Calhoun County, Alabama**

(Page 14 of 14)

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	Drum handling	<ul style="list-style-type: none"> • Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionization detector/flame ionization detector (PID/FID) equipment and upgrade to respirator if necessary. • When filling a drum (with either soil or water), be careful not to make contact with the contained waste. Wear appropriate gloves. Make sure lid or bung of drum is secure. • If moving a drum unassisted, be sure to leverage properly, use proper lifting techniques, and wear safety glasses and steel-toed boots. • When using a drum dolly, make sure straps and lid catch are securely attached. Leverage properly when tilting drum. Be sure toes stay away from drum.
	UXO	<ul style="list-style-type: none"> • UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • UXO avoidance monitoring shall apply to all intrusive activities associated with well construction completion. • If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist immediately.

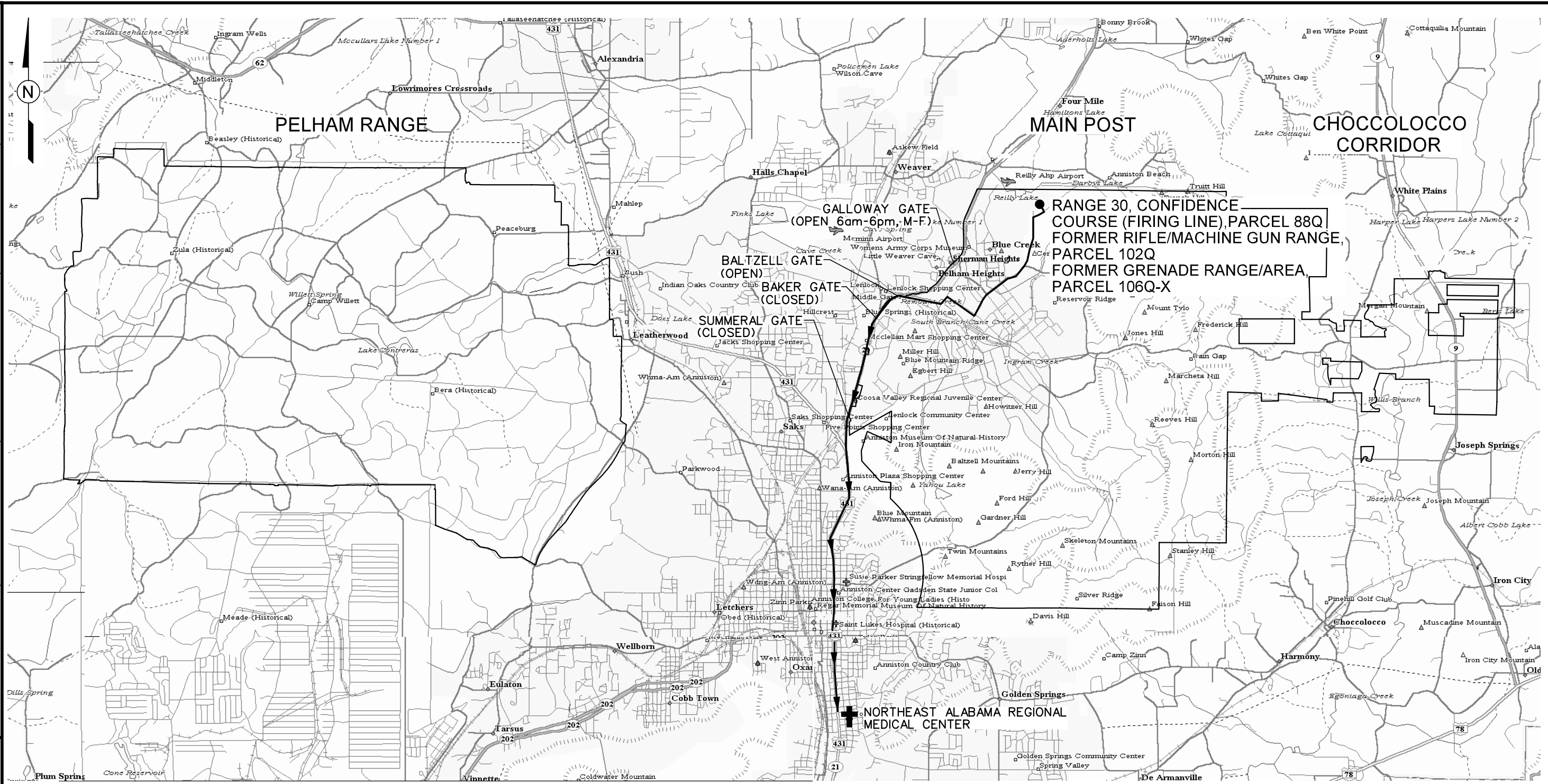


FIGURE 5-1
HOSPITAL EMERGENCY ROUTE

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

ATTACHMENT 1

Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities

Site Name: Parcel 88Q, Parcel 102Q, and Parcel 106Q-X

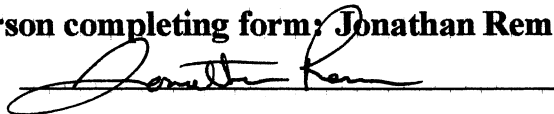
Job Number: 796887

Date: 4-Jan-02

Name of person completing form: Jonathan Remo

Title: Geologist

Signature:



1a. Have the historical records available for this HTRW site been reviewed? Yes ☒ No ☐

If the answer to 1a. is yes, proceed to 1b.

If the answer to 1a. is no, review site information prior to completing this form.

1b. Is there recent information (site walk, worker interviews, etc.) that indicates a potential OE/CWM hazard at this site? Yes ☒ No ☐

Proceed to 2.

2. According to the records review, is this site known or suspected to have been used for:

	Yes	No
2a. Manufacturing, production, or shipping of conventional or chemical warfare materiel (CWM) OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Live fire testing of any ordnance:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conventional or CWM OE training:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Storage of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal or demilitarization of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

	Yes	No
2b. Manufacturing, production, or shipping of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Research or testing of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chemical agent related training:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Storage of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal or demilitarization of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

Any 2a question answered "YES" indicates UXO support is required for all site activities. If all 2a questions are answered "NO", UXO support may not be required. Refer to Installation-Wide Safety and Health Plan (SHP) for additional information concerning UXO support. Proceed to question 2b.

Any 2b question answered "YES" requires the remainder of this form to be completed. If all 2b questions are answered "NO", real-time monitoring for chemical agent will not be required and completing the remainder of this form is not required. Refer to SHP for additional information concerning agent monitoring.

Additional space for notes and explanations on page 4.

Continue to page 2 of 4 –

Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities
Site Name: Parcel 88Q, Parcel 102Q, and Parcel 106Q-X

Page 2 of 4

Job Number: 796887

Date: 4-Jan-02

3. For sites where the manufacturing, testing, storage, or disposal of CWM is suspected:	Yes	No
Is there evidence that the CWM is/was containerized in potentially unexploded ordnance:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there evidence that the CWM is/was containerized in nonexplosive containers:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there evidence that the CWM is open to the environment (i.e., in an open container or free liquid/solid in the soil/water):	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there evidence that the CWM hazard has been removed from the site or that the site has been decontaminated:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the site been previously monitored or sampled for chemical agent or agent breakdown products:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
For any "YES" above, was the agent or breakdown product identified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

For any "Yes", list types of agent (mustard, lewisite, etc.) and the form (in ordnance, in drum, etc.) the CWM is expected to be found (or state "unknown"):

List agent breakdown products identified:

4. Defining the Potential for the Presence of CWM:	Agent Monitoring Requirements for Site Activities:
4a. High Presence Potential – Definition: CWM is known or highly suspected to be present at the site in a condition (within ordnance and/or nonexplosive container, or in an uncontainerized form in sufficient volume that weathering of the product has not rendered it harmless) that will cause potential harm to personnel if it is encountered.	Mandatory personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).
4b. Moderate Presence Potential - Definition: CWM is suspected to have been present at the site, but has been previously removed and/or decontaminated, or has been open to the environment such that it is expected to have degraded and been rendered harmless.	The need for personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples will be reviewed on a site-by-site basis. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).
4c. Low Presence Potential – Definition: No indications that CWM will be present in quantity or reactivity (in munitions, projectiles, drums, etc.).	No specific personal or area monitoring for chemical agents required beyond what is specified in the SHP.

Continue to page 3 of 4 -

Site Name: Parcel 88Q, Parcel 102Q, and Parcel 106Q-X

Job Number: 796887

Date: 4-Jan-02

Based on the information available for this site, including information gathered during completion of this form, the potential for CWM to be present at this site, as defined above, is expected to be: **LOW**

Exceptions/Explanations:

(additional space for notes and explanations on page 4)

5. Based on the information provided in questions 1 through 5, above, the following guidelines will be used for establishing PPE requirements for activities to be performed at this site; Specific details are provided in the SSHP:

5a. High Exposure Potential - High exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "High Exposure Potential" will be Level B (supplied air) or Level C (full-face respirator with HEPA/Acid Gas/OV cartridges w/ emergency egress hood) and chemically resistant coveralls. Specific PPE requirements are in the SSHP for this site.

5b. Moderate Exposure Potential - Moderate exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "Moderate Exposure Potential" will be Modified Level D (disposable coveralls and emergency egress hood) carried by all personnel. Specific PPE requirements are in the SSHP for this site.

5c. Low Exposure Potential - Low exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

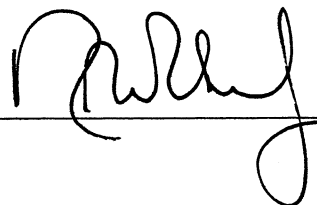
Subject to review by the IT CIH, no additional PPE requirements above those stated in the SSHP are needed for sites identified as having "Low Exposure Potential." Specific PPE requirements are in the SSHP for this site.

Based on all available information, the exposure potential at this site is considered to be: **LOW**

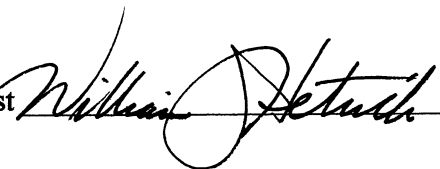
Exceptions/Explanations:

Review Signatures:

IT UXO Technical Manager



Date: 7 JAN 02 IT H&S Specialist



Date: 1/10/02

Site Name: Parcel 88Q, Parcel 102Q, and Parcel 106Q-X

Job Number: 796887

Date: 4-Jan-02

Additional Notes and Explanations:

See Table 1-1 for Range History and Descriptions.

**Site-Specific UXO
Safety Plan**

**Final
Site-Specific Unexploded Ordnance Safety Plan Attachment**

Site Investigation at

**Range 30, Confidence Course (Firing Line), Parcel 88Q
Former Rifle/Machine Gun Range, Parcel 102Q
Former Grenade Range/Area, Parcel 106Q-X
Tank Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08)
Grenade Court (OA-15)
Unnamed Small Arms Range**

**Fort McClellan
Calhoun County, Alabama**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

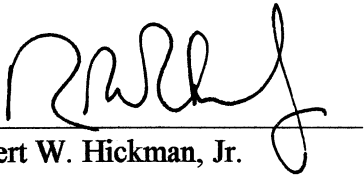
**Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887**

January 2002

Revision 0

Final
Site-Specific Unexploded Ordnance Safety Plan Attachment
Site Investigation at Range 30, Confidence Course (Firing
Line), Parcel 88Q, Former Rifle/Machine Gun Range, Parcel
102Q, Former Grenade Range/Area, Parcel 106Q-X, Tank
Sub-Caliber/Carbine Transition/Machine Gun Range (OA-08)
Grenade Court (OA-15), Unnamed Small Arms Range

I have read and approve this site-specific unexploded ordnance (UXO) safety plan attachment for Range 30, Confidence Course (Firing Line), Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; and Former Grenade Range/Area, Parcel 106Q-X and three ranges described in the Archive Search Report (ASR) to be investigated as part of this work plan: Tank Sub-Caliber Range/Carbine Transition Range/Machine Gun Range, Grenade Court, and Unnamed Small Arms Range at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation UXO procedures.



Robert W. Hickman, Jr.
UXO Technical Manager

7 JAN 02
Date



William J. Hetrick, CIH
Health & Safety Manager

1/10/02
Date

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List of Acronyms

See Attachment 1, List of Abbreviations and Acronyms, of the Site-Specific Field Sampling Plan Attachment contained in this binder.

1.0 Introduction

This document defines anomaly avoidance procedures for activities to be performed by IT Corporation (IT) unexploded ordnance (UXO) personnel in conjunction with the site investigation at Range 30, Confidence Course (Firing Line), Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; and Former Grenade Range/Area, Parcel 106Q-X at Fort McClellan (FTMC), Calhoun County, Alabama. In addition, three ranges described in the Archive Search Report (ASR) will also be investigated as part of this work plan: Tank Sub-Caliber Range/Carbine Transition Range/Machine Gun Range, Grenade Court, and Unnamed Small Arms Range. This document is not a stand-alone document; it must be used in conjunction with the *Fort McClellan Unexploded Ordnance Supplementary Procedures* (IT, 2001), attached as Attachment 1.

IT UXO personnel will perform visual surveys, assisted by hand-held magnetometers and metal detectors, to support the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analysis at Range 30, Parcel 88Q; Former Rifle/Machine Gun Range, Parcel 102Q; Former Grenade Range/Area, Parcel 106Q-X; and the three additional ranges included in this safety plan. The purpose is to avoid any ordnance and explosives (OE) during hazardous, toxic and radioactive waste (HTRW) sampling activities. Intrusive anomaly investigation is not authorized for this site work.

Parcels 88Q, 102Q, and 106Q-X are located in the northern part of the Main Post of Fort McClellan, east of Reilly Airfield. The range fan for Parcel 88Q covers an area of approximately 545 acres. The range fans for Parcel 102Q and 106Q-X cover an area of approximately 13 and 10 acres, respectively. However, the area of investigation for this SI will be limited to approximately 34 acres. This area incorporates all of Parcel 106Q-X; that portion of Parcel 88Q located north of the Fill Area at Range 30, Parcel 231(7) and an adjacent unpaved road; and that portion of Parcel 102Q located northwest of Parcel 231(7). Parcel 88Q occupies both the north and south sides of Falcon Road. The southeastern portion of Parcel 88Q, which includes the range's likely impact area, will be addressed separately. A small portion of the area of investigation to the northwest overlaps the area of investigation for the Fill Area East of Reilly Airfield, Parcel 227(7). In addition, a portion of the area of investigation to the southeast overlaps the Fill Area at Range 30, Parcel 231(7). Therefore, data collected for the SI at Parcels 227(7) and 231(7) will be incorporated into the SI for Parcel 88Q, 102Q, and Parcel 106Q-X, where appropriate.

Range 30, Confidence Course is located in the northern part of the Main Post and was used from 1977 to between 1983 and 1989. Based on the location of Reilly Airfield to the northwest of Range 30, the position of the firing line, and orientation of the range fan presented in the Environmental Baseline Survey (EBS), the direction of fire was most likely to the southeast. The impact area is not identified in the EBS. However, based on the probable direction of fire, the impact area is most likely an unnamed hill located southeast of the area of investigation. This area will be addressed separately.

According to the EBS, Former Rifle/Machine Gun Range, Parcel 102Q, was one of seven former rifle/machine gun ranges that were identified in the northern part of the Main Post. The dates of operation and types of ordnance fired at these ranges are unknown. According to historical maps, four ranges were in use in 1917. However, it is unclear which four of the seven former ranges were active at that time. The remaining three ranges appear on later historical maps (1959 and 1966). Based on the orientation of the firing lines and range fans presented in the EBS, the direction of fire for Parcel 102Q was to the southeast. Impact areas for these ranges were not identified in the EBS. The likely impact area for Parcel 102Q will be addressed separately.

According to the EBS, Parcel 106Q-X was identified in the northern part of the Main Post. The Former Grenade Range/Area appears on a 1959 map; however, exact dates of use are unknown. The EBS identified the impact area for Parcel 106Q-X to be in the southern portion of the parcel, within the area of investigation for this SI. No impact areas were noted during an October 2001 site walk. Review of available aerial photographs did not confirm the presence of Parcel 106Q-X.

In addition to Parcels 88Q, 102Q, and 106Q-X described in the EBS, three other ranges or areas included in this investigation are shown on Plates 5, 6, and 10 of the U.S. Army Corps of Engineers *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama, July 1999* (ASR). This SI will investigate both the EBS-defined ranges (Parcels 88Q, 102Q, and 106Q-X) and the three ranges depicted on the ASR plates within the area of investigation.

2.0 UXO Team Composition

UXO team and personnel requirements will be in accordance with EP 75-1-2 (USACE, 2000) and installation-wide sampling and analysis plan (SAP) (IT, 2000) for FTMC. A UXO team will be on site during all sampling or intrusive activities where OE is suspected.

3.0 Responsibilities

The UXO Team Leader is responsible for ensuring that personnel performing UXO tasks at FTMC have the required qualifications. The UXO Team Leader supervises and coordinates UXO work activities.

The UXO team member(s) will provide UXO avoidance, explosive ordnance recognition, location, and safety functions for IT employees and any subcontractors during sampling activities. Sampling activities at this site include surface and subsurface soil sampling, drilling and installing monitoring wells, sampling of monitoring wells, survey of sample points, and safe access and egress to and from the site in support of HTRW operations.

4.0 Authority

UXO personnel are authorized to perform UXO avoidance activities only. UXO personnel are not permitted to initiate OE investigative or disposal activities.

5.0 UXO Avoidance Procedures to Support HTRW Sampling Activities at FTMC

The scope of work for site investigation activities at sites described in this safety plan includes the following UXO tasks:

- Provide UXO avoidance support during the collection 39 surface soil samples, 33 subsurface soil samples, 5 groundwater samples, 3 subsurface water samples, and 3 sediment samples. Sample locations are defined in Section 4.0 of the site-specific field sampling plan contained in this binder.

- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Provide surveys for all intrusive field activities (e.g., digging, fence post driving, grading, or excavation).

Since these areas may contain OE contamination, the UXO team must conduct a surface access survey for UXO before any type of activities commence. This includes foot and vehicular traffic. UXO avoidance activities will include:

a) Access Corridors and Sampling Sites

- (1) The UXO team will conduct access surveys of the footpaths and vehicular lanes approaching and leaving each of the investigation sites. Access surveys will begin in a known clear area and proceed by the most direct route to the sampling site. The boundaries of the access route and sampling site will be marked with white tape or white pin flags.
- (2) If an OE item is found during the survey, the location will be conspicuously marked with a red pin flag and avoided by altering the route. Additionally, UXO personnel will complete the IT FTMC “Unexploded Ordnance Report Form.” Subsurface anomalies will be marked with a yellow flag.
- (3) The boundaries of the access route and sampling site will be recorded in the IT FTMC “UXO Sketch Log” by the UXO technician. Additionally, anomaly locations will be recorded on this form.
- (4) Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or the Whites Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated as specified in the appropriate operator’s manual. All equipment will be function tested prior to use following the procedure in paragraph 3.2, *FTMC UXO Supplementary Procedures* (IT, 2001) and the operator’s instructions. The Whites Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature to assist in eliminating anomalies created by “hot rocks.”
- (5) The access route will be twice as wide as the widest vehicle that will use the route. Footpath lanes will be a minimum of three feet wide.

- (6) If surface OE or subsurface anomalies are encountered that cannot be avoided, the access route must be diverted to avoid contact. No personnel will be allowed outside of the surveyed areas without a UXO escort. No unescorted access is permitted inside the corridor area until a survey has been completed and boundaries established.
- (7) At the actual investigation site, the UXO team must also complete a survey of an area sufficient to support mechanical excavation equipment maneuverability, parking of support vehicles, and establishment of decontamination stations. As a minimum, the surveyed area should have a dimension in all directions equal to twice the length of the largest vehicle or piece of equipment to be brought on site. White pin flags or tape will be used to mark the boundaries of the surveyed site.
- (8) Surface soil samples are normally collected at depths of 0 to 12 inches below ground surface. The UXO team will survey the area of the soil-sampling site for any indication of OE. Sampling is not permitted at any location where an anomaly has been detected.
- (9) Tracked or other vehicles whose movement would disturb the soil are authorized for use only in areas that have been surveyed and in which no anomalies have been detected.
- (10) If grading or soil movement is required to support access corridor development or a sampling location, UXO personnel will perform a survey. After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per cut. If additional grading is required, another survey will be performed after each one-foot of soil has been removed.
- (11) Erosion and weathering will typically cause some OE items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional surveys may be required. The decision regarding the performance of follow-on surveys will be made by the site superintendent with input provided by the FTMC UXO Safety Officer and FTMC UXO Team Leader. The decision will be based on such factors as: the amount of time since the last survey was performed, the weather during this period, the terrain in the area of concern, the former use of the area, and the type of quantity of OE found during initial surveys.
- (12) Incremental geophysical surveys at drill hole locations will be initially accomplished using a hand auger to install a pilot hole. An access survey of the immediate vicinity of the pilot hole location will precede the installation of the pilot hole. The UXO team will use a manual or

mechanical portable auger to install the pilot hole. The augured hole will be inspected for anomalies with a geophysical instrument (configured for downhole utilization) in two-foot increments as the hole is advanced below ground surface. Hand augering of a hole will not proceed if an anomaly is detected that cannot be positively identified as inert material. If a suspect OE item is encountered, the sampling personnel must select a new drill hole location. The pilot hole will also be inspected with the geophysical instrument upon reaching the final depth of the hand augered hole, providing a total clearance depth equal to pilot hole depth plus two feet. If the proposed site is still free of magnetic anomalies, the drilling equipment may be brought on site and utilized. The UXO team will continue to inspect the drill hole for anomalies at two-foot increments as the drilling is advanced from the clearance depth of the pilot hole until a depth of 12 feet is reached.

b) Vegetation Removal

In cases where large trees or other vegetation removal is required to support access or sampling operations, the procedures in paragraph 4.2, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed.

c) Magnetometer/Metal Detector Checkout and Field Procedures

The procedures in paragraph 3.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed. Since a portion of the areas included in this survey were once part of a grenade range and impact area, the function test will utilize the function test ordnance that most closely approximates the MK 2 Grenade and 75mm projectile. If other types of ordnance are encountered, the UXO Team Leader may designate additional or other function test ordnance as appropriate.

d) UXO Logbooks and Documentation

All UXO personnel identified in paragraph 5.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will maintain a logbook in accordance with that procedure.

6.0 Safety

In addition to the requirements of the site-specific safety and health plan prepared for this site, the UXO personnel will ensure the following:

- a) During the access and subsurface surveys conducted with a geophysical instrument, the UXO team members will not wear safety shoes or other footwear that would cause the instrument to present a false response.
- b) The UXO team will not be required to wear protective helmets unless an overhead hazard is present.
- c) The FTMC UXO Safety Officer will monitor UXO activities to ensure compliance with applicable safety requirements.
- d) The FTMC UXO Safety Officer will certify that all FTMC UXO workers are capable of performing UXO activities at FTMC based on observation of work performance.
- e) The FTMC UXO Safety Officer is responsible for all site-specific UXO training.
- f) The UXO technician on site will advise project personnel regarding all evacuation and/or exclusion zones as appropriate. The UXO technician will monitor all sampling site activities to ensure that only the minimum number of personnel are present on site.

7.0 Quality

The IT FTMC UXO Quality Control Officer will follow quality control instructions and procedures listed in Section 9.0 of the installation-wide OE management plan contained in Volume IV of the SAP (IT, 2000) appropriate to this task and the FTMC UXO Supplementary Procedures. The IT FTMC UXO Quality Control Officer will also utilize the “UXO Avoidance Quality Control Report” to document his activities. Copies of this form will be provided to the IT quality assurance representative upon request.

8.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 2001, *Fort McClellan Unexploded Ordnance Supplementary Procedures*, June.

IT Corporation (IT), 2000, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, March.

U. S. Army Corps of Engineers (USACE), 2000, ***Engineering Publication, EP 75-1-2, Unexploded Ordnance (UXO) Support During Hazardous, Toxic, and Radiological (HTRW) and Construction Activities***, 20 November.

U.S. Army Corps of Engineers (USACE), 1999, ***Archives Search Report, Maps, Fort McClellan, Anniston, Alabama***, July.

ATTACHMENT 1

FORT MCCLELLAN UNEXPLODED ORDNANCE SUPPLEMENTARY PROCEDURES

FTMC UXO SUPPLEMENTARY PROCEDURES

Subject: Ordnance and Explosives

1.0 INTRODUCTION

IT Corporation (IT) has been retained by the U.S. Army Corps of Engineers-Mobile District, under Contract Number DACA21-96-D-0018, to provide environmental services related to Base realignment and closure (BRAC) of Fort McClellan, Alabama. The Installation-Wide Ordnance and Explosives (OE) Management Plan for Fort McClellan (FTMC) was prepared by IT Corporation and submitted as a final document in March 2000. The Installation-Wide OE Management Plan was prepared to provide general guidance for conducting unexploded ordnance (UXO) work associated with hazardous, toxic, and radiological waste (HTRW) investigations and remedial activities currently in progress at FTMC. IT Corporation prepares site-specific field sampling, health and safety, and UXO safety plans for sites where fieldwork will occur that may potentially contain OE. A UXO Safety Plan is not prepared for sites that are not reported to be in areas containing OE.

1.1 Purpose

This document is intended to provide procedures to the field staff that outline UXO operations and clarify activities currently permitted under "anomaly avoidance." The document is not intended to replace any of the project documents currently approved; rather, it is intended to complement those documents with additional information that allows successful completion of the job.

2.0 FTMC EMPLOYEE ORIENTATION/TRAINING AND CERTIFICATION

The IT FTMC orientation program is designed to:

- Indoctrinate new employees to FTMC-unique procedures
- Verify compliance with regulatory certification requirements
- Provide continuing instruction and updating in UXO fundamentals to sustain readiness to safely perform UXO tasks

2.1 Responsibilities

The IT OE Service Center Operations Manager will oversee the training programs and maintain a master record of UXO employee training and certification status.

The UXO person designated as the senior IT UXO individual at FTMC will schedule the orientation listed below.

The FTMC UXO Safety Officer will:

- Conduct all UXO-specific orientation and training at FTMC
- Certify that each new UXO employee is capable of performing UXO work activities at FTMC
- Maintain FTMC training files and records on each UXO technician on site reflecting his or her current training status.

2.2 UXO Employee Orientation

Every UXO employee assigned to FTMC will receive a site-specific UXO orientation in addition to training required by the Occupational Health and Safety Administration (OSHA). This orientation will include, as a minimum, the following topics:

- Local emergency response drills and procedures
- Personal protective equipment (PPE) and personnel decontamination procedures
- Ordnance recognition/UXO expected to be encountered at FTMC
- Equipment safety
- FTMC site orientation
- Chemical warfare material (CWM) awareness and procedures
- Communications procedures
- FTMC Logbook/data recording procedures
- IT administrative policies and procedures
- Magnetometer checkout procedures.

Upon completion of the UXO employee orientation, the FTMC UXO Safety Officer will monitor the performance of the new hire for at least three workdays while conducting typical UXO activities. The FTMC UXO Safety Officer will then certify that the individual is capable of performing UXO activities at FTMC

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superseded or modified by the member Company.

based upon satisfactory performance of the three-day period. A copy of this certification will be maintained in the individual's site FTMC training file (see example at Attachment 1).

2.3 UXO Sustainment Training

All UXO technicians have had the OSHA 40-hour hazardous waste operations and emergency response (HAZWOPER) course in order to be initially certified at FTMC. They are also required to maintain the certification with an 8-hour OSHA refresher course on an annual basis. Additionally, all IT FTMC UXO personnel will have 8 hours of site-specific annual UXO sustainment training. This training can be performed incrementally (2 hours every quarter) at the discretion of the site superintendent in coordination with the FTMC IT UXO Safety Officer. Topics will include, but are not limited to, the following subjects:

- Site-specific environmental hazards
- Site-specific UXO hazards, ordnance fuzing, functioning and precautions
- Topics which the IT UXO Team Leader or IT Safety UXO Officer determines necessary to support FTMC UXO activities

Sustainment training will be conducted for a period of no less than 8 hours. Daily safety briefings, tailgate safety meetings, and other required site-specific training are not a substitute for this training. The purpose of this training is to provide each UXO employee with site-specific UXO training over and above OSHA requirements. The site-specific UXO training will be recorded in the project file and the UXO employee's personnel file.

3.0 FTMC MAGNETOMETER/METAL DETECTOR FUNCTION TEST AND FIELD PROCEDURES

This section provides FTMC magnetometer/metal detector function tests and operating procedures to be employed at all work sites that have been identified as requiring avoidance support.

3.1 Geophysical Test Plot

The purpose of a test plot is to provide a consistent environment where the equipment can be evaluated. The location of the geophysical test plot will be inside the IT compound. It will be established as follows

- The test plot will consist of an area approximately 20 x 20 feet and clear of vegetation and magnetic anomalies, located in the IT compound next to the southeast end of the office trailers.
- Five metal test objects will be buried at depths varying from 6 inches to 24 inches. The objects will approximate the weight, diameter, and length of an MK 2 grenade, a 60mm mortar, a 2.36-inch rocket warhead, a 75mm projectile, and a 37mm projectile. Additionally, three non-ferrous test objects will be buried at a depth of 2 inches to 8 inches. A 6-inch length of 1/2-inch reinforcing rod will be placed on the surface for use as a surface check source. Items with greater mass will be buried at greater depths. Each burial location will be marked with a wooden stake located about 6 inches to the north of the object. Each stake will be assigned a reference number and will be tagged or marked to denote the depth, type of item and orientation of the item. The site will utilize native soils; no fill material will be brought in from another area. Sand will be used to cover the area to mitigate the effects of wet weather.
- For downhole magnetometer testing, a length of 2-inch PVC pipe will be buried to a depth of 36 inches. The pipe should be of sufficient length to allow at least another 24 inches to extend above the surface of the ground. A metal object will be buried at a depth of 24 inches and 24 inches from the side of the pipe. The location of the item, similar in size and mass to a 75mm projectile, will be marked with a wooden stake tagged to denote the depth, type of item, orientation, and reference number assigned.

3.2 Magnetometer/Metal Detector Check-Out Procedures

- Prior to field use, all magnetometers and metal detectors will be set up following the guidelines in the manufacturer's operating manual for the specific instrument used. Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or White's Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated in a manner consistent with instructions contained in the appropriate operator's manual. All equipment will be function-tested prior to use. The White's Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature, to assist in eliminating anomalies created by "hot

rocks.” The operating manual for each of the instruments used at FTMC will be available for use with the equipment.

- Once the instrument has been determined to be working according to the manufacturer’s operating manual, the operator will perform a function test on the FTMC geophysical test plot using the detection methods described in the manual. A function test will consist of using the instrument over a minimum of three test sources. The same sources will be used during each function test to ensure consistency. The instrument detection indicator, as described in the operator’s manual, will be noted in the instrument logbook. For site checks, a 6-inch length of 1/2-inch steel reinforcing rod will be available to each operator at the work site.
- Instruments that fail to reproduce a detection indication consistent with previous tests will be checked to ensure that the power supply or batteries are sufficient. If the power supply is determined to be sufficient and the operator cannot find a fault in accordance with the operator’s manual, the instrument will be tagged and removed from service.
- Function tests will be performed each morning before the equipment is put into service.
- If an instrument is determined to be working improperly, the FTMC UXO Team Leader and the site superintendent will be immediately notified. Any activities performed using that instrument since its last positive test procedure will be considered invalid and will require reevaluation.
- Upon completion of the function test, the “Magnetometer/Metal Detector Functions Test Data Sheet” (Attachment 2) and the equipment logbook will be filled out.
- After an instrument has been function-tested at the beginning of each day, the instrument will be checked at least once during every hour of use or each time the instrument is turned on after having been turned off. This check will consist of dropping the 6-inch length of 1/2-inch reinforcing rod in a clear area and passing the detector over the rod in a manner consistent with the operator’s instructions. The instrument indication will be compared to the indication produced during the morning function test.

Instruments that fail to produce a consistent indication will be checked and removed from service as required.

3.3 Equipment Documentation

Each piece of equipment will be assigned a logbook noting the make, model, manufacturer, and serial number of the equipment. The logbook and manufacturer's operating manual will be present when the equipment is tested. The following information will be recorded:

- Date and time
- The test plot object used (assigned stake number)
- The reading or indication at each test site
- Whether or not the reading or indication was satisfactory
- The name of the individual performing the test.

The IT FTMC Quality Control (QC) Officer will observe the daily testing of all equipment and will record the results of each test in his field logbook.

3.4 Magnetometer/Metal Detector Field Procedures

All intrusive field activities in potential OE areas (e.g., digging, fence post driving, grading, well installation or excavation) will be preceded by a UXO sweep. Each hole made in areas where OE may potentially be found will have a check immediately over the spot of the intrusion. Magnetometer operations at FTMC will assume a detection depth of one foot when surveying an area for excavation.

All magnetometers and metal detectors will be operated in accordance with the manufacturers specifications and procedures.

When surveying a potential area for a sampling well, an area of sufficient size will be surveyed to allow for installation of required pads and bollards. After the well is installed, the location of bollards will be adjusted as required if an anomaly is detected during the bollard installation process.

The White's Metal Detector will be used to augment the magnetometers on sites where "hot rocks" are suspected. The purpose of using the metal detector in addition to the magnetometers is to eliminate the probability of "hot rocks."

4.0 FTMC ACCESS CLEARANCES, VEGETATION REMOVAL, AND ROAD MAINTENANCE

This section is designed to provide specific procedures regarding activities associated with the building of access corridors, vegetation removal, and road maintenance in support of FTMC operations.

4.1 Access Corridors

The purpose of access corridors is to enable IT personnel access to well and/or other types of sampling sites within FTMC. Access corridors will be created by marking the route, both length and width, in which a UXO survey has been performed. The marking method will be defined in each site-specific UXO safety plan. No unescorted access is permitted until a corridor has been established. If an anomaly is detected during the survey or during a subsequent excavation, it must be avoided, since investigation is not authorized. The route will be altered to avoid the anomaly for FTMC activities. A magnetometer is considered to reliably detect anomalies to a depth of one foot.

The size of each area to be surveyed is dependent on the type and quantity of equipment expected to be used on that site. The UXO survey crew will follow the procedures outlined in the site-specific UXO safety plan to determine the dimensions of the area to be surveyed. Normally, the width of the access route will be at least twice as wide as the widest vehicle that will use the route; footpaths will be a minimum of 3 feet wide.

Tracked or other vehicles, that disturb the soil are authorized for use only in areas that have been surveyed and no anomalies have been detected.

Erosion and weathering will typically cause some UXO items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional UXO surveys may be required. The decision regarding the performance of additional surveys will be made by the FTMC UXO team leader and the IT FTMC UXO Safety Officer. The site superintendent will be notified of this decision. This decision will be based on, but not limited to, such factors as: the amount of time since the last survey was performed; the weather during this period; the terrain in the area of concern; and the type and quantity of UXO found during initial surveys.

4.2 Vegetation Removal

In cases where removal of large trees or other types of vegetation is required, the following procedures will be followed:

- The UXO technician will survey around the base of the tree or vegetation, and, if no anomaly is detected, direct the bulldozer or other equipment to proceed. If an anomaly is detected, the location will be recorded and marked and another route will be selected. The size of the area to be surveyed will depend on the size of the suspected root system of the tree to be removed.
- Once the tree has been pushed over, the UXO technician will survey around the root ball and the area in and around the hole. If an anomaly is detected, the anomaly will be recorded and marked and an alternate route will be selected. If no anomaly is detected, the UXO technician will direct the equipment operator to proceed with the excavation.

4.3 Road Maintenance

Remote range roads and trails frequently require a certain amount of repair to remain passable. This section describes authorized actions regarding the maintenance of dirt or gravel range roads by IT UXO personnel.

- Bulldozers or grader-type equipment is authorized to repair roads and trails as long as a UXO survey has been performed and no anomalies have been detected.
- The UXO technician will observe the blade of the equipment as the earth is moved. If a potential UXO is uncovered, the UXO technician will signal the equipment operator to immediately stop the equipment. The UXO technician will then attempt to visually identify the object. If the object cannot be positively identified as a non-hazardous item, the equipment will be moved, the location of the object marked and recorded on the IT FTMC Unexploded Ordnance Report Form (Attachment 3), and the route changed to avoid the object. If no suspicious objects are detected, the equipment will continue to move earth at a rate of no more than one foot of depth at a time. If, more grading is required after the first pass is complete the UXO technician will perform another survey. If no anomalies are detected, the equipment can repeat the grading process. If an anomaly is detected, the operation will be halted and the route changed.

- After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per lift. If additional grading is required, a survey will be performed after each one-foot increment the soil has been removed.
- Earth may not, at any time, be moved at a rate of more than one foot in each lift.

5.0 FTMC UXO LOG BOOKS

All UXO team leaders or UXO technicians supporting HTRW operations will maintain a logbook. The purpose of the logbook is to record UXO actions and activities taken at each work site.

5.1 Responsibilities

UXO personnel will maintain an individual daily logbook of work activities.

The logbooks will be routinely inspected weekly by the UXO QC Officer and will be made available to the FTMC site superintendent upon request. Copies will be made daily and filed in the IT Field Project office.

Logbooks will contain bound and numbered pages. Entries will be on successive pages as work is performed. The individual using the logbook will sign the page after the last entry for that page has been made. Logbooks are part of the project legal file and will be filed with the project files upon completion of each investigation.

5.2 Data Requirements

As a minimum, individual logbooks will contain the following information:

- Date, time and location of UXO activities
- Personnel involved in the activities
- UXO activities performed, including UXO/anomalies found
- A description of areas swept
- A record of the magnetometer or other equipment used, including instrument serial number
- Weather conditions.

The IT FTMC QC Officer will utilize the IT FTMC “UXO Avoidance Quality Control Report” (Attachment 4) to document checks of field activities.

Additionally, UXO personnel will complete IT FTMC Form “UXO Sketch Log” (Attachment 5) and IT FTMC Unexploded Ordnance Report Form. The “UXO Sketch Log” will contain a description of activities, including the dimensions of the area surveyed. A description of the length and width will be recorded, as well as the manner in which the survey was performed. These forms will be completed as required and presented to the site superintendent.

ATTACHMENT 1

FTMC Employee Certification (Example)

I certify that (name of individual) has fulfilled all UXO orientation requirements and has been observed by me for a period of 3 work days and is therefore eligible to perform UXO activities at FTMC.

Jim Kerr
FTMC UXO Safety Officer

ATTACHMENT 2

Magnetometer/Metal Detector Functions Test Data Sheet

Each magnetometer and/or metal detector will receive a function test at the beginning of each workday and after changing batteries. The function test will include operating the magnetometer/metal detector over a test area developed specifically for ensuring that detection instruments are operating properly. Instruments that do not pass the function test will be tagged out until repairs are made or a replacement instrument is available.

Project Number: _____

Instrument Model: _____

Instrument Serial Number: _____

Date	Person Performing Test	Function Test Results	Remarks

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superseded or modified by the member Company.

ATTACHMENT 3

Unexploded Ordnance Report Form

Report Tracking Number:															
Discovery and Reporting Time															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time of Discovery</th> </tr> <tr> <td style="width: 50%; text-align: center;">Date</td> <td style="width: 50%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time of Discovery		Date	Time			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time Reported to Base Transition Force</th> </tr> <tr> <td style="width: 50%; text-align: center;">Date</td> <td style="width: 50%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time Reported to Base Transition Force		Date	Time		
Time of Discovery															
Date	Time														
Time Reported to Base Transition Force															
Date	Time														
Employee Name: _____		Reported to FTMC Transitional Force Personnel													
		Name: _____													
Location of Ordnance															
Location, Description, and Parcel Number:															
Coordinates of Ordnance:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">State Plane Coordinates</th> </tr> <tr> <td style="width: 50%; text-align: center;">Northing</td> <td style="width: 50%; text-align: center;">Easting</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		State Plane Coordinates		Northing	Easting								
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4">Picture Taken of Ordnance</th> </tr> <tr> <td style="width: 25%; text-align: center;">Yes</td> <td style="width: 25%; text-align: center;">No</td> <td style="width: 25%; text-align: center;">Date</td> <td style="width: 25%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td></td> </tr> </table>				Picture Taken of Ordnance				Yes	No	Date	Time				
Picture Taken of Ordnance															
Yes	No	Date	Time												
Written Description and/or Sketch of Ordnance:															
Corrective Action Taken by Fort McClellan Transition Force															
Date															

ATTACHMENT 4

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.

UXO Quality Control Report

Project Location: _____

Date: _____

Work Site Location: _____

Day: _____

1. Personnel Involved:

2. Description of Work Being Performed:

3. Equipment Utilized:

4. Comments:

Completed By

Printed Name & Title

Signature

Date

ATTACHMENT 5

UXO Sketch Location Log

District: _____ Hole Number: _____ Date: _____

Company Name: IT Corporation

Subcontractor: _____

Parcel Location: _____ Well Location: _____ Date Started: _____ Date Completed: _____

Type of UXO Work Being Performed:

Most Probable Munition: _____

Down-Hole Depth Achieved for UXO Avoidance: _____

Total Number of Surface UXO Marked: _____

Total Number of Anomalies Marked: _____

Location Sketch/Comments:

Not to Scale

Signature of UXO Technician:

Date:

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.